

USSR

UDC 613.269:664.848]:661.981.553

FINOGENOVA, N. V., Candidate of Biological Sciences, and BUDAGYAN, F. Ye.,  
Professor

"Hygienic Evaluation of Bottled Mushrooms As To Possible Botulism"

Moscow, Gigiyena i Sanitariya, No 11, Nov 70, pp 33-35

Translation: It is widely known that bottled food plays a leading role in the development of botulism in man. Commercially canned and bottled foods have caused almost no cases of botulism in recent decades in the USSR, while outbreaks involving home-canned food have occurred which is related to the greater use of home canning techniques.

Increasing numbers of cases involving jars of preserved mushrooms have caused special concern. Obviously, the explanation must be sought in the following: 1) It is extremely difficult to completely wash mushrooms free of soil particles in view of the spongy and laminar structure of the under-surface of their caps. Also, we know that the pathogen of botulism is often present in soil; 2) *Cl. botulinum* is an obligate anaerobe and when a nutrient medium is present, it can multiply in a hermetically sealed jar.

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UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119722

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. Z EQUALS CARBOBENZOXY THROUGHOUT. TO 5 G SERINE IN 25 ML SN NAOH WAS ADDED AT NEGATIVE 5 DEGREES OVER 1 HR 22.5 ML 2N NAOH AND 11.5 G Z, GLY, CL AT PH 8-9, AND THE MIXT. WARMED TO 5 DEGREES AND KEPT 40 MIN TO YIELD 48.5 PERCENT Z, GLY, SER (I), M. 98-101 DEGREES. Z, PRO IN ETOAC AT NEGATIVE 6 DEGREES WAS TREATED WITH DICYCLOHEXYLCARBODIIMIDE (DCC) AND C SUB6 CL SUB5 OH TO YIELD AFTER 1 DAY, FINALLY AT ROOM TEMP., Z, PRO, OC SUB6, CL SUB5, OIL, (ALPHA) PRIME 22 D NEGATIVE 40.3 DEGREES, WHICH IN ACOH TREATED WITH 40 PERCENT HBR IN ACOH AT NEGATIVE 20 DEGREES 0.5 HR GAVE PRO, OC SUB6 CL SUB5, M. 112-14 DEGREES, WHICH WITH DCC IN DMF CONVERTED I IN 1 DAY, FINALLY AT ROOM TEMP., INTO 67.5 PERCENT Z, GLY, SER, PRO, OC SUB6 CL SUB5, M. 112-14 DEGREES, WHICH WAS HYDROGENATED OVER PD IN MEOH, ETOH, HCL TO GLY, SER, PRO, OC SUB6 CL SUB5, HCL, M. 170 DEGREES; HBR IN MEND SUB2 IN 20 MIN SIMILARLY GAVE THE CORRESPONDING HBR SALT, M. 187-80 DEGREES. THE LATTER IN ME SUB2 SO WITH ET SUB3 N IN 7 DAYS IN A SEALED TUBE GAVE SOL. AND INSOL. PRODUCTS, IDENTIFIED AS POLY(GLY, SER, PRO), MOL. WT. UP TO 2500. Z, HYP IN THF WITH ISO, BUO SUB2 CCL AND ET SUB3 N, FOLLOWED BY C SUB6 CH SUB5 OH GAVE 89 PERCENT PENTACHLOROPHENYL ESTER, M. 162-4 DEGREES, WHICH WITH HBR IN MEND SUB2 AT NEGATIVE 5 DEGREES 20 MIN GAVE HYP, OC SUB6 CL SUB5, HBR (II, HBR), DECOMP. 210 DEGREES.

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PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0119722

ABSTRACT/EXTRACT--I IN DMF WITH ET SUB3 N TREATED IN THE COLD WITH ISO, BUO  
SUB2 CCL, FOLLOWED BY II, GAVE OVERNIGHT 42PERCENT Z, GLY, SER, HYP, OC SUB6  
CL SUB5, M. 157-9DEGREES, WHICH IN CF SUB3 CO SUB2 H WITH HBR 0.5 HR  
GAVE GLY, SER, HYP, OC SUB6 CL SUB5. HBR DECOMPD. 178-80DEGREES, WHICH WITH  
ET SUB3 N IN ME SUB2 SO 5 DAYS GAVE POLY(GLY, SER, HYP), MOL. WT. IS  
SIMILAR TO 6000. FACILITY: INST. MOL. BIOL., MOSCOW, USSR.

UNCLASSIFIED

1/3 008 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--SYNTHESIS OF POLYPEPTIDES OF REGULAR STRUCTURE CONTAINING SERINE  
AND GLUTAMIC ACID, AND MODELING NONPOLAR REGIONS OF THE COLLAGEN PROTEIN  
AUTHOR--(04)-SHIBNEV, V.A., KHALIKOV, SH.KH., FINGENOVA, M.P., POROSHIN,  
K.T.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR. SER. KHIM. 1970, (4), 880-5

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PEPTIDE, CHEMICAL SYNTHESIS, AMINO ACID, COLLAGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAHE--3004/0482

STEP NO--UR/0062/70/000/004/0880/0885

CIRC ACCESSION NO--AP0131119

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2/3 008

UNCLASSIFIED

PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0131119

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. TREATING 5 G HYDROXYPROLINE IN 88PERCENT HCO SUB2 H WITH 20 ML AC SUB2 O AT 10DEGREES AND KEEPING THE MIXT. 1.2 HR, FINALLY AT 30DEGREES, GAVE 96PERCENT FORMOXYPROLINE (IA), M. 127DEGREES. ADDING 2 G POCL SUB3 IN CH SUB2 CL SUB2 TO 2.1 G CARBOBENZOXYGLYCINE AND 12 ML PYRIDINE, FOLLOWED BY 2.17 G 2,4,6 CL SUB3 C SUB6 H SUB2 OH (I) AT 00DEGREES, AND KEEPING THE MIXT. 1 HR GAVE 91PERCENT CARBOBENZOXYGLYCINE 2,4,6 TRICHLOROPHENYL ESTER, M. 109DEGREES, WHICH WITH 40PERCENT HBR IN ACOH GAVE IN 25 MIN GLYCINE 2,4,6 TRICHLOROPHENYL ESTER HBR (II), DECOMPD. 215DEGREES. FORMYGLYCINE (4.5 G) AND 8.5 G I IN MECN H SUB2 O AT MINUS 4DEGREES TREATED WITH 9 G DICYCLOHEXYLCARBODIIMIDE (DCC) OVERNIGHT GAVE FORMYGLYCINE 2,4,6 TRICHLOROPHENYL ESTER, M. 105-7DEGREES, WHICH WITH ETOM AQ. HCL 2.5 DAYS GAVE 62PERCENT GLYCINE 2,4,6 TRICHLOROPHENYL ESTER HCL, DECOMPD. 210DEGREES. TREATING FORMYLGLUTAMIC ACID GAMMA BENZYL ESTER WITH DMF AND, AT MINUS 4DEGREES, WITH DCC, THEN II AND ET SUB3 A, AND KEEPING THE MIXT. 2 DAYS, GAVE 85PERCENT FORMYLGLUTAMYL (GAMMA BENZYLESTER) GLYCINE 2,4,6 TRICHLOROPHENYL ESTER, M. 110-12DEGREES, WHICH WITH AQ. ALC. HCL SEVERAL DAYS GAVE 61.5PERCENT 2,4,6 TRICHLOROPHENYL ESTER OF GLUTAMYL (GAMMA BENZYL ESTER) GLYCINE HCL (III), M. 134-7DEGREES. IA (3.22 G) IN DMF TREATED WITH 4.5 G DCC, AND AT MINUS 5DEGREES WITH 6.4 G III AND 1.8 ML ET SUB3 H GAVE IN 2 DAYS 40PERCENT 2,4,6 TRICHLOROPHENYL ESTER OF FORMYLHYDROXYPROLYL GLUTAMYL (GAMMA BENZYL ESTER) GLYCINE, AN OIL, WHICH WITH HCL IN AQ. MEON 2 DAYS GAVE 70PERCENT 2,4,6 TRICHLOROPHENYL ESTER OF HYDROXY PROLYLGLUTAMYL (GAMMA BENZYL ESTER) GLYCINE HCL, AN OIL.

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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0131119

ABSTRACT/EXTRACT--THIS IN ME SUB2 SO WITH ET SUB3 N 10 DAYS GAVE 90PERCENT POLY(TRIPEPTIDE) (OF HYDROXYPROLYLGLUTAMYL (GAMMA BENZYL ESTER) GLYCINE), A DARK SOLID, (ALPHA) SUBD PRIME27 MINUS 20.5DEGREES, MOL. WT. SIMILAR TO 85000. THIS HYDROGENATED OVER PD IN MEOH TO POLY(HYP GLU GLY), WHOSE IR SPECTRUM INDICATED THE COLLAGEN TYPE STRUCTURE. TREATING CARBOBENZOXYSERINE WITH DCC IN DMF, FOLLOWED BY GLYCINE 2,4,6 TRICHLOROPHENYL ESTER HBR AND ET SUB3 N GAVE IN 24 HR IN THE COLD 80.5PERCENT 2,4,6 TRICHLOROPHENYL ESTER OF CARBOBENZOXYSERYLGLYCINE, M. 124-6DEGREES, WHICH IN MEOH WAS HYDROGENATED OVER PD TO THE 2,4,6 TRICHLOROPHENYL ESTER OF SERYLGLYCINE, ISOLATED AS HCL SALT, DECOMPD. 165-7DEGREES. SIMILARLY WERE OBTAINED: 80PERCENT 2,4,6 TRICHLOROPHENYL ESTER OF CARBOBENZOXHYDROXYPROLYLSERYLGLYCINE, M. 153-4DEGREES; 2,4,6 TRICHLOROPHENYL ESTER OF HYDROXYPROLYLSERYLGLYCINE HCL, M. 180DEGREES; AND POLY (HYP SER-GLY) (ALPHA) SUBD PRIME27 MINUS 15.4DEGREES, WITH MOL. WT. 5500. FACILITY: INST. MOL. BIOL., MOSCOW, USSR.

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FINOGENOVA, N. V., Candidate of Biological Sciences, and BUDAGYAN, F. Ye.,  
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"Hygienic Evaluation of Bottled Mushrooms As To Possible Botulism"

Moscow, Gigiyena i Sanitariya, No 11, Nov 70, pp 33-35

Translation: It is widely known that bottled food plays a leading role in the development of botulism in man. Commercially canned and bottled foods have caused almost no cases of botulism in recent decades in the USSR, while outbreaks involving home-canned food have occurred which is related to the greater use of home canning techniques.

Increasing numbers of cases involving jars of preserved mushrooms have caused special concern. Obviously, the explanation must be sought in the following: 1) It is extremely difficult to completely wash mushrooms free of soil particles in view of the spongy and laminar structure of the under-surface of their caps. Also, we know that the pathogen of botulism is often present in soil; 2) *Cl. botulinum* is an obligate anaerobe and when a nutrient medium is present, it can multiply in a hermetically sealed jar.

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Of the chemicals capable of suppressing the multiplication and toxin-formation of *Cl. botulinum* and which are used in mushroom preservation, we can rely only on sodium chloride and acetic or citric acid. However, sodium chloride, according to generally accepted recipes, is used in such amounts that its concentration does not exceed 4.5% in the brine of prepared mushrooms. Still, literature data (F. N. Belousskaya) show that suppression of multiplication *Cl. botulinum* is observed at a salt concentration of 6-8% and higher.

Additionally, there is evidence that the pH of the medium in preserved food is a principal factor suppressing the viability of this microbe. K. F. Meyer, summing up data from several authors in his monograph, states that for preventive considerations the pH of marinades for product preservation must not be higher than 4.0. In the view of Townsend et al., the inhibitory pH is somewhat higher -- 4.5. R. G. Matrozova also agrees with this higher figure, based on her own studies.

The receipes and methods of marinating mushrooms available in domestic

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literature for home and commercial preserving differ widely. The object of this study was to determine the pH of mushroom marinades prepared by different methods and thus to recommend the most reliable procedure.

Six samples of preserved food were studied: "Griby belyye marinovannyye" [White Mushrooms, marinated], prepared at the Gomel' Fruit and Vegetable Combine, the Kirzhach and Smolensk canning plants, and also six samples of preserved food "Griby maslyata marinovannyye" [Mushrooms, maslyenok type, marinated], prepared at the Kirzhach Canning Plant of the Oblpotrebsoyuz [Oblast Union of Consumers' Cooperatives]. The mushrooms at the plants are prepared according to the Instruktsiya zavodskoy podrabotki marinovannykh gribov po uproshchennoy tekhnologicheskoy skheme na marinovannykh gribov po uproshchennoy tekhnologicheskoy skheme no plodokon-  
servnykh zavodakh sistemy potrebitel'skoy kooperatsii (Instructions for Commercial Canning of Marinated Mushrooms Following the Simplified Technological Scheme at Fruit Canning Plants of the Consumers' Cooperative System), confirmed on 23 September 1965 (Table 1).

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TABLE 1

Recipe For Preparing 100 kg of Marinating Broth

Marinade composition	Mushrooms	
	white	others
Salt (in kg)	1.70	1.70
Vinegar essence, 80%	2.20	1.10
Bay leaves (in kg)	0.12	0.12
Tarragon (in kg)	0.06	0.07
Hot pepper, cinnamon, and clove (in kg), each	0.06	--
Water (in liters)	96	97

We prepared five samples of the bottled "Griby maslyata marinovannye" by the procedure described by A. F. Namestnikov.

Prepared and washed mushrooms were arranged in a kettle containing a small amount of hot water and were boiled. Salt and condiments were added to the

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water. When the water containing the mushrooms began boiling, heat was turned down to simmering (8-10 minutes for caps and 15-20 minutes for stems). 30 g of salt, 5 sticks of tarragon, and 2-3 pieces each of cloves, bay leaves, cinnamon, and anise were added per kg of mushrooms. Immediately after boiling, the mushrooms were removed from the water and dumped onto a colander. Mushrooms drained from the broth were mixed while still hot with vinegar essence; 5-7 ml of vinegar essence (80%) was used per kg of boiled mushrooms. The essence was first poured into a glass into which a small (one-third cup) amount of mushroom broth had been poured and the mushrooms were evenly immersed in the mixture. The mushrooms were mixed with vinegar, arranged while still hot in prepared half-liter jars, and sterilized in boiling water for 20-25 minutes (counted from the moment the water began boiling).

Additionally, five samples of bottled "Griby maslyata" were prepared by the method described by K. I. Kaputsin and L. I. Vorob'yeva.

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1 kg of prepared and washed mushrooms was lowered into boiling water (1 cup) to which 1 tablespoon salt (25-30 g) had been added, along with citric acid (0.1-0.5 g) and condiments (bay leaves, cinnamon, clove, tarragon, and anise) in the amount of two pieces of each of the condiments, added up to the tips of the stems. The mixture was boiled over a low flame for 20 minutes without removing the foam that appeared. The hot boiled mushrooms were placed in jars, covered with the hot filtered broth in which they were boiled, covered with lids, and then the mushrooms were sterilized by subjecting the half-liter jars to 20-25 minutes of boiling (counted from the moment the water began simmering). After removal, the jars were capped tightly, using a capping machine.

Jars containing the mushrooms were stored for 1.5-2 months in ordinary conditions at room temperature, after which they underwent laboratory testing. The findings, interpreted statistically, are given in Table 2, from which it is clear that the pH of preserved marinated mushrooms of commercial production is less than 4.0, which completely guarantees suppression of the growth of the botulism bacillus. As for home-preserved bottled mushrooms, their pH values are higher than in commercially produced preserved mushrooms --

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higher than 4.0. The differences between the mean pH values of mushrooms of commercial and household production are statistically reliable ( $P < 0.01$ ).

TABLE 2  
Physicochemical Indexes of Preserved Mushrooms

Mushrooms in marinade, preserved	pH		Total acidity in terms of acid (%)			Salt content (in %)	
	n	M $\pm$ m	Confidence limits of the mean	M $\pm$ m	Confidence limits of the mean	M $\pm$ m	Confidence limits of the mean
Total acidity in terms of acid (in %)							
Commercially prepared, White	6	3.67 $\pm$ 0.08	3.43-3.91	0.57 $\pm$ 0.05	0.42-0.72	3.01 $\pm$ 0.18	2.47-3.55
Maslyenok type	6	3.77 $\pm$ 0.04	3.65-3.89	0.44 $\pm$ 0.04	0.32-0.56	2.56 $\pm$ 0.07	2.35-2.77
Homemade Maslyenok type							

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(Table 2 continued)

By method of

A. F. Names-  
tnikov

5 4.25±0.1 3.95±4.55 0.25±0.02 0.20-0.32 3.80±0.11 3.47-4.13  
In terms of citric acid

By method of

K. I. Kapus-  
tin and L. I.  
Vorob'yeva

5 5.36±0.09 5.09-5.63 0.10±0.005 0.085-0.115 2.40±0.08 2.16-2.64

We do not believe it advisable to wholly reject the recipe recommended by A.F. Namestnikov. However, we propose that a maximum amount of 80% vinegar es-  
sence -- 7 ml (and not 5 ml) -- be used per kg of boiled mushrooms.

Since the pH of mushrooms prepared by the method of K. I. Kapustin and L. I. Vorob'yeva, according to our data, is within the limits 5.15-5.6, we are forced to withhold our recommendation for this recipe, in spite of the tastiness of the preserved product.

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Thus, an inadequate acid concentration is given in the popular literature cited on home-preserving of mushrooms, which can unfavorably affect the chance of botulism spores growing in preserved food.

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UDC 547.29+665.592+663.1

LOZINOV, A. B., Candidate of Biological Sciences, and FINOGENOVA, T. V.,  
Candidate of Biological Sciences

"Microbiological Synthesis of Organic Acids From Petroleum Hydrocarbons"

Moscow, Zhurnal Vsesoyuznogo Khimicheskogo Obschestva imeni D. I. Mendeleyev,  
Vol 17, No 5, 1972, pp 526-532

Abstract: The article considers the possibilities of using aliphatic, alicyclic and aromatic petroleum hydrocarbons as the raw material for the production of organic acids with microorganisms. Routes for the degradation of n-alkanes by microorganisms are analyzed, and data on the biosynthesis of acids on this substrate with microorganisms are discussed. There are promising prospects for the use of n-alkanes for the microbiological synthesis of various types of organic acids -- saturated and unsaturated fatty acids, aliphatic dicarboxylic acids, hydroxy, keto and aldo acids, acids of the tricarboxylic acid cycle. Conditions which assure the supersynthesis of organic acids with microorganisms are considered, as well as conditions for the directed microbiological synthesis of citric acid, isocitric acid, fumaric acid, alpha-ketoglutaric acid and malic acid. Prospects are also considered for the synthesis of various cyclic acids by the microbiological transformation of acyclic and aromatic hydrocarbons.

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FINOGENOVA, V.K.

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# XI-3. OBTAINING THE MATERIALS OF $A_3B-A_2B_6$ SOLID SOLUTIONS CLOSE TO CHARACTERISTIC

[Article by Ye. V. Malashnikova, V. I. Kozlov, V. N. Morozov, A. A. Petrov, Z. A. Stukhachenko, L. A. Zhuravskaya, V. K. Finozenova, V. A. Khachatryan, Z. N. Kozlov, Izhutskiy Novosibirsk, III Simpozium po Tverdogornym Veshcham, Sibirskiy Poluprovodnikoviy Kristalloy I Prikladnaya Fizika, 12-17 June 1972, p 140]

A study was made of the conditions of the crystallization of directional crystallization of amorphous solid solutions of InAs-CdTe and InSb-CdTe. The distribution of the composition of the solid solutions along the InAs corresponds to a diagram of states of pseudobinary systems.

It was discovered that all the crystals grown from the stoichiometric melt have limiting and constant concentration of the conduction electron ( $n \sim 10^{15} \text{ cm}^{-3}$  for InAs-CdTe and  $n \sim 5 \cdot 10^{16} \text{ cm}^{-3}$  for InSb-CdTe) which is caused by the peculiarities of the crystallization processes of solid solutions of the  $A_3B-A_2B_6$  type. The segregation coefficients of the  $A_2$  and  $B_6$  elements for crystallization of the solid solutions are found in the same ratios as pure  $A_3B$  compounds.

Studies were made of the possibility of obtaining materials with different concentration of the current carriers by varying the degree of stoichiometry of the investigated compounds. Studies were made of the optical and the galvanomagnetic properties of the characteristic solid solutions on the materials obtained.

1/2 . 020 UNCLASSIFIED PROCESSING DATE--11SEP70  
TITLE--TEMPERATURE COMPOSITION PHASE DIAGRAM OF A SODIUM TELLURIDE  
TELLURIUM SYSTEM -U-  
AUTHOR--FINOGENOVA, V.K., USKOV, A.A., POPOVKIN, B.A., NOVOSELOVA, A.V.  
COUNTRY OF INFO--USSR  
SOURCE--VESTN. MOSK. UNIV., KHIM. 1970, 11(1), 56-8  
DATE PUBLISHED-----70  
SUBJECT AREAS--MATERIALS  
TOPIC TAGS--THERMAL EFFECT, PHASE DIAGRAM, SODIUM COMPOUND, TELLURIUM, X  
RAY ANALYSIS, EUTECTIC MIXTURE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1989/0613 STEP NO--UR/0189/70/011/001/0056/0058  
CIRC ACCESSION NO--AP0107210  
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PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0107210

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE NA SUB2 TE AND TE SYSTEM WAS STUDIED BY THERMAL AND X RAY PHASE ANAL. METHODS AND THE PHASE DIAGRAM WAS DETD. IN ADDN. TO NA SUB2 TE, 2 OTHER COMPS. ARE FORMED IN THE SYSTEM: NATE SUB3 M. CONGRUENTLY AT 455 PLUS OR MINUS 5DEGREES AND NATE M. INCONGRUENTLY AT 360 PLUS OR MINUS 5DEGREES. THE EUTECTIC BETWEEN THE COMPS. IS AT 40 MOLE PERCENT NA SUB2 TE AND 320.5DEGREES. NATE SUBE FORMS A EUTECTIC WITH TE AT SIMILAR TO 9PERCENT NA SUB3 TE 405 PLUS OR MINUS 5DEGREES. THE M.P. FOR NA SUB2 TE WAS FOUND TO BE 1035 PLUS OR MINUS 5DEGREES. THE X RAY PHASE ANAL. IS IN COMPLETE AGREEMENT WITH THE DATA FROM THE THERMAL ANAL.

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FINOGEYEVA, G. G., KOVAL', Ye. N., and KUZNECHENKOV, V. P.

"Memory Element with 2-Aperture Transfluxor"

USSR Author's Certificate No 275142, Filed 7/02/69, Published 6/10/70  
(Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i  
Vychislitel'naya Tekhnika, No 5, 1971, Abstract No 5B286P)

Translation: Memory elements with 2-aperture transfluxors made of material with a rectangular hysteresis loop, operating in the mode of partial switching, are well known. The basic shortcoming of these elements is the low linearity of the accumulation characteristic  $U=f(N)$  ( $U$  is the amplitude of the pulse taken from the output winding of the transfluxor,  $N$  is the number of pulses recorded), which occurs as a result of the non-ideal rectangularity of the hysteresis loop of the magnetic material, the finite dimensions of the transfluxor, and other factors. The memory elements suggested differ in that the output winding of the transfluxor is connected to its load through a quadrupole which is made as an integrating RC circuit with changing time constant. This allows linearization of the accumulation characteristic. 3 figs.

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UDC 621.791.7.002:62-474

FIGWIN, V. I., Candidate of Technical Sciences, Kuybyshev Aviation Institute

"Technological Features in Welding Very Thin-Walled Pipes"

Moscow, Svarochnoye Proizvodstvo, No 5, May 70, pp 23-24

Abstract: The article considers the technique of contact-roller and arc welding of longitudinal seams of pipes with wall thickness of 0.12-0.6 mm. The principal diagrams of the formation of pipes and design features of welding machines are presented. It is shown that the method of pushing shape-formed strip into the welding zone, which makes it possible to avoid deformation of the edges and work hardening of the pipe walls, is the most effective for the production of pipes 6-20 mm in diameter; the method of pushing-drawing shape-formed strip through a die at the rate of up to 50 m/hr using contact-roller and argon arc welding is the most effective for pipes 20-125 mm in diameter; pipes 125-500 mm in diameter are most effectively welded by the argon arc method with spiral seam and by dragging the strip into the welding zone. The significant advantages of fusion welding of tubes is that the surfaces are clean and dry, which eliminates the need for washing, degreasing, and drying of pipes. Pipes produced by argon arc welding are not susceptible to crevice corrosion and can be used in aggressive media.

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1/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--ANODIC METHOXYLATION OF 1,3-BUTADIENE --J-  
AUTHOR--(03)-ZHURINOV, A.ZH., MIRKINO, L.A., FIOUSHIN, M.YA.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. AKAD. NAUK KAZ. SSR, SER. KHIM. 1970, 20(2), 57-60  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--ELECTROLYSIS, METHOXY COMPOUND, BUTADIENE, GAS CHROMATOGRAPHY,  
CHEMICAL REACTION MECHANISM, HEXENE, BUTENE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--3001/0264 STEP NO--UR/0360/70/020/002/0051/0060  
CIRC ACCESSION NO--AP0126036  
UNCLASSIFIED

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PROCESSING DATE--13NOV70

CIRC ACCESSION NO--AP0126036

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ELECTROLYSIS OF MECH,KOH,H  
SUB2 C:CHCH:CH SUB2 MIXT. GAVE A MIXT. OF  
1,6,DIMETHOXY,2,VINYL,4,HEXENE, 1,HYDROXY 4,METHOXY,2,BUTENE, AND  
1,8,DIMETHOXY,2,6,OCTADIENE. THE PRODUCTS WERE SEPD. AND IDENTIFIED BY  
GAS CHROMATOG. THE REACTION MECHANISM IS DISCUSSED. FACILITY:  
MOSK. KHIM. TEKHNL. INST. IM. MENDELEEVA, MOSCOW, USSR.

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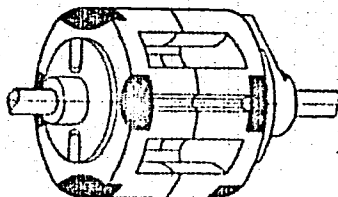
UDC: 621.372.837.1

YUR'YEV, F. N., KISELEV, R. I., ROGOV, L. S., ~~FIREB, V. I.~~

"A Waveguide Switch"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 31, Nov 71, Author's Certificate No 318102, Division H, filed 24 Mar 69, published 19 Oct 71, pp 198-199

Translation: This Author's Certificate introduces a waveguide switch containing a stator and rotor with waveguide channels, radial grooves and absorbing elements. As a distinguishing feature of the patent, decoupling between channels is increased by locating the absorbing elements at the ends of  $\frac{1}{4}$ -wave grooves from the level of the narrow walls of the waveguide channels to the end faces of the rotor.



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USSR

UDC: 621.396.69:621.316.543(088.8)

FIRER, V. I., YUR'YEV, F. N., LARENKOV, A. P.

"A Coaxial Switch"

USSR Author's Certificate No 253882, filed 2 Feb 68, published 29 Jun 70  
(from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12V383 P)

Translation: This Author's Certificate introduces a coaxial switch which contains a stator with plugs fastened to it, a rotor connected to a rotating axle, commutating lines, and a mechanism for fixing rotor positions. To improve decoupling between channels, the stator and rotor are equipped with semicircular channels arranged on the arc of a circle, which form the outer conductor of the commutating lines, while the inner conductors of the commutating lines are accommodated in the rotor channel. The inner conductors are connected by dielectric supporting elements to shields which are radially arranged.

1/1

USSR

UDC 669.71.046.44

ARLYUK, B. I., KIRILLOVA, T. A., YERMOLAYEVA, E. M., SMIRNOV, M. N., FIREKOVA, I. B.

"Analysis of the Phase Composition of Aluminate Cakes and Slurry by the Chemical Method"

Tr. Vses. n.-i. i provektn. in-ta alumin., magn. i elektrokh. prom-sti (Works of the All-Union Scientific Research and Planning and Design Institute of Aluminum, Magnesium and Electrode Industry), 1970, No 70, pp 43-50 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 46126)

Translation: On the basis of investigation of the solubility of compounds contained in the cakes and slurries of alumina production, a procedure is proposed for successive leaching out of them in alkaline and acid solutions for quantitative phase analysis. The correspondence of the analysis results by the given procedure and also the results from x-ray micrography and crystal-optical methods is demonstrated. The basic causes of incompleteness of extraction of the  $Al_2O_3$  and  $Na_2O$  from the cakes is the formation of Ca-aluminates and Na-Ca-silicates during the sintering process and also the occurrence of secondary reactions when leaching out the crushed cake leading to the formation of hydrogranates and tricalcium hydroaluminate. 1 illustration and 5 tables.

1/1

Acc. Nr:

AP0047645

Abstracting Service:

CHEMICAL ABST. 5-70

Ref. Code:

UR 0080

104601z Solid solutions of  $2\text{CaO} \cdot \text{SiO}_2$  with some metal oxides. Eremin, N. I.; Egereva, A. I.; Dmitrieva, A. M.; Firfarova, I. B. (Vses. Nauch.-Issled. Proekt. Inst. Alyum., Magn. Elektrodnoi Prom., Leningrad, USSR). *Zh. Prikl. Khim.* (Leningrad) 1970, 43(1), 18-24 (Russ). Solid solns. of  $2\text{CaO} \cdot \text{SiO}_2$  (I) with each of  $\text{Na}_2\text{O}$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{TiO}_2$ , and  $\text{MgO}$  formed either during slow or rapid cooling of heat-treated mixts. were investigated by means of x-ray anal. The soly. of  $\text{Na}_2\text{O}$ ,  $\text{Fe}_2\text{O}_3$ ,  $\text{TiO}_2$ , and  $\text{MgO}$  in the  $\beta$ -modification of  $2\text{CaO} \cdot \text{SiO}_2$  is 0.6, 1.8, 0.75, and 1.0% and the  $n_s$  of the solid solns. formed are 1.728-1.730, 1.740-1.742, (not given), and 1.730, resp. The phase diagram for the  $\text{MgO}$ - $2\text{CaO} \cdot \text{SiO}_2$  system is presented. The effect of the metal oxides on the transition of the  $\beta$  into the  $\gamma$ -modification of  $2\text{CaO} \cdot \text{SiO}_2$  is discussed. Ivan Wichterle

REEL/FRAME

19791219

18nt

Single Crystals

USSR

UDC 548.0:539.171

ZASIMOV, V. S., KUZ'MIN, R. N., and FIROV, A. I., Moscow State University  
imeni M. V. Lomonosov

"Observation of the Diffraction of Resonant Gamma-Quanta From an FeNi  
Single Crystal"

Moscow, Kristallografiya, Vol 17, No 4, 1972, pp 864-865

Abstract: Investigation results are presented on the diffraction of resonant gamma-quanta from an FeNi (50 at%Fe) single crystal cut so that its surface corresponded to the (111) crystallographic surface. The gamma-quanta, obtained on a Mössbauer diffractometer, had a natural content of  $^{57}\text{Fe}$  isotope. The diffraction maxima and the Mössbauer spectra obtained by scattering of gamma-radiation with an energy of 14.4 keV ( $\lambda \sim 0.86 \text{ \AA}$ ) are discussed. The energy spectrum for the (111) reflex ( $\theta_1 = 12^\circ$ ) shows a characteristic dip; the Mössbauer spectrum for the (222) reflex ( $\theta_2 = 24^\circ 30'$ ) has a smaller dip. The increase in the order of reflection is equivalent to the decrease of the effective thickness of the crystal, producing a reduction in the resonance absorption and a relative intensity increase of nuclear scattering. Two figures, fourteen bibliographic references.

1/1

1/2 039 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--MEASUREMENT OF IONOSPHERIC PARAMETERS FROM THE DOPPLER AND FARADAY  
EFFECTS OF COHERENT SIGNALS FROM GEOPHYSICAL ROCKETS RECORDED AT WIDELY  
AUTHOR--(G5)--MISYURA, V.A., KROKHMALNIKOV, YE.B., ZINCHENKO, G.N.,  
FIRSAKOV, A.S., SLUTSKER, S.M.  
COUNTRY OF INFO--USSR

SOURCE--GEOMAGNETIZM I AERONOMIIA, VOL. 10, NO. 2, 1970, P. 244-249

DATE PUBLISHED--70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, MISSILE TECHNOLOGY

TOPIC TAGS--GEOPHYSIC RACKET, VERTICAL PROFILE, IONOSPHERE, IONOSPHERIC  
STATION, ELECTRON DENSITY, DOPPLER EFFECT, FARADAY EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1997/0145

STEP NO--UR/0203/70/010/002/0244/0429

CIRC ACCESSION NO--AP0119141

UNCLASSIFIED

2/2 039

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0119141

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. APPLICATION OF A DIVERSITY RECEPTION TECHNIQUE TO THE DETERMINATION OF VERTICAL ELECTRON CONCENTRATION PROFILES, HORIZONTAL GRADIENTS, AND THE INTEGRAL ELECTRON CONTENT IN A VERTICAL IONOSPHERIC COLUMN AT HEIGHTS ON THE ORDER OF 500 KM. THE PARAMETERS OBTAINED ARE COMPARED WITH SIMULTANEOUS IONOSPHERIC SOUNDING DATA OBTAINED AT SEVERAL IONOSPHERIC STATIONS LOCATED AT DIFFERENT POINTS AROUND THE LAUNCHING SITE.

UNCLASSIFIED

USSR

UDC 631.811.55:45.401.635.2

PIRSAKOWA, S. A. and SMIRNOV, V. A.; All-Union Scientific Research Institute of Fodders, Lugovaya, Moskovskaya Oblast

"Degree of Contamination of Pasture Fodder by Strontium-90 in 1965-1967"

Moscow, Agrokimiya, No 11, Nov 1971, pp 125-131

Abstract: One of the tasks facing researchers since the appearance of radioactive residents in the biosphere, is to lower the transfer of radioactivity, including Sr-90, through the soil-fodder-animal-milk-man chain into the human system. The authors ran tests on Sr-90 contamination of pasture land as affected by the addition of calcium in varying amounts, and by depth of aration taken. The years 1965-1967 were considered. The effect of peat dirt, peat fertilizers was studied; also, the effect of Sr-90 contamination on grass yield.

- END -

CSO: 1841-W

1/1

USSR

UDC 616.9-056.3-092:616-056.13

KRAVCHENKO, A. T., and FIRSANOV, V. I., State Institute imeni L. A. Tarasevich for the Control of Medical and Biological Preparations, Moscow

"Infectious Allergy. XIII. Role of Hypersensitivity of the Delayed Type in the Development of Infectious Allergy to Bacterial Exotoxins"

Moscow, Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, Vol 48, No 2, Feb 71, pp 98-103

Abstract: Following sensitization of guinea pigs with sublethal doses of diphtheria or botulinus exotoxin, the animals showed a positive reaction of the delayed type in skin tests with the respective toxoid. Animals sensitized with either exotoxin also developed a non-specific sensitivity to diphtheria exotoxin, which was indicated by the results of Schick tests and the cytotoxic action of this toxin on peritoneal macrophages. The macrophages of guinea pigs sensitized to diphtheria exotoxin showed an

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USSR

KRAVCHENKO, A. T., and FIRSANOV, V. I., Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii, Vol. 48, No. 2, Feb. 71, pp 98-103.

increased capacity to bind this toxin as compared with control animals, while the capacity to bind diphtheria toxin by macrophages of animals sensitized with botulinus toxin remained unchanged. Upon passive transfer to guinea pigs of infectious allergy to diphtheria toxin by the injection of macrophages from sensitized animals, the skin of the recipients showed a positive reaction to diphtheria toxoid and macrophages were more sensitive to the cytotoxic effect of diphtheria exotoxin, while an increased skin sensitivity to the exotoxin did not develop. The results showed that development of specific sensitization (hypersensitization of the delayed type) had no direct connection with the condition of infectious allergy to bacterial toxins, which was nonspecific and associated with a general increase in the reactivity of the organism rather than the effect of antibodies and lymph cells.

2/2

1/2 022

UNCLASSIFIED

PROCESSING DATE--30OCT70

TITLE--ON DISSOCIATION OF A NEUTRAL COMPLEX FROM DIPHTHERIA EXOTOXIN AND  
ANTITOXIN IN THE ORGANISM OF ANIMALS IN THE STATE OF INFECTIOUS ALLERGY  
AUTHOR--(02)--KRAVCHENKO, A.T., FIRSANOV, V.I.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL MIKROBIOLOGII, EPIDEMIOLOGII I IMMUNOBIOLOGII, 1970, NR 6,  
PP 54-58

DATE PUBLISHED--70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ALLERGIC DISEASE, BACTERIAL TOXIN, DIPHTHERIA, SEROLOGY

CCNTRCL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--3001/1839

STEP NO--UR/0016/70/000/006/0054/0058

CIRC ACCESSION NO--AP0127249

UNCLASSIFIED

2/2 022

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0127249

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ADMINISTRATION TO GUINEA PIGS SENSITIZED WITH BACTERIAL EXOTOXINS OF A COMPLEX OF DIPHTHERIA TOXIN WITH SPECIFIC SERA (IN EXCESS) PROVOKED CLINICAL SIGNS OF INTOXICATION, AND SOME OF THE ANIMALS PERISHED. THE ACTIVITY OF THE COMPLEX DEPENDED ON THE TYPE OF SPECIFIC SERUM INTRODUCED INTO IT. IN ORDER OF DESCENDING ACTIVITY OF THE COMPLEXES THE SERA WERE PLACED THUS: HOMOLOGOUS, HORSE AND RABBIT. GUINEA PIGS SENSITIZED WITH NORMAL HORSE SERUM OR WITH COMPLETE FREUND'S ADJUVANT FAILED TO REACT TO THE ADMINISTRATION OF A NEUTRAL COMPLEX FROM DIPHTHERIA EXOTOXIN WITH SPECIFIC SERA. FACILITY: GOSUDARSTVENNYY KONTROL'NYY INSTITUT. IM. TARASEVICH, MOSKVA.

UNCLASSIFIED

1/2 040  
TITLE--EXCITATION OF SURFACE WAVES ON AN IMPEDANCE PLANE IN AN ANISOTROPIC  
PLASMA -U-  
AUTHOR--FISANOV, V.V.  
COUNTRY OF INFO--USSR  
SOURCE--IZV. VUZ. RADIOELEKTRONIKA, VOL. 13, JAN. 1970, P. 53-58  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--SURFACE WAVE, PLASMA WAVE, HOMOGENEOUS PLASMA, LOW TEMPERATURE  
PLASMA, EXTERNAL MAGNETIC FIELD, ANISOTROPY, ELECTROMAGNETIC WAVE  
GENERATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1992/0072  
CIRC ACCESSION NO--AP0111266  
STEP NO--UR/0452/70/013/000/0053/0058  
UNCLASSIFIED

2/2 040

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0111266

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. STUDY OF THE EXITATION OF SURFACE WAVES ON AN IMPEDANCE PLANE PLACED IN A HOMOGENEOUS, COLLISIONLESS, COLD ANISOTROPIC PLASMA. THE IMPEDANCE PLANE COINCIDES WITH THE ZERO  $Z$  PLANE OF A CARTESIAN COORDINATE SYSTEM, AND THE HALF SPACE WHERE  $Z$  IS GREATER THAN ZERO IS FILLED BY THE PLASMA. AN EXTERNAL CONSTANT MAGNETIC FIELD COINCIDES WITH THE DIRECTION OF THE SOURCE AND IS APPLIED IN THE POSITIVE DIRECTION OF THE  $Y$  AXIS. THE SOURCE CONSISTS OF A LINEAR MAGNETIC FLUX LINE ELEVATED ABOVE THE IMPEDANCE PLANE. PREVIOUS STUDIES DEMONSTRATED THE EXISTENCE OF UNIDIRECTIONAL SURFACE WAVES ON AN IDEALLY CONDUCTING SCREEN PLACED IN AN ANISOTROPIC PLASMA. BY REPLACING THE SCREEN WITH AN IMPEDANCE PLANE, THE PRESENT STUDY EXTENDS THE RANGE OF EXISTENCE FOR THESE WAVES AND ESTABLISHES THEIR RELATION TO ORDINARY TWO DIRECTIONAL SURFACE WAVES. DATA ARE GIVEN FOR THE RANGE OF EXISTENCE, DIRECTION OF PROPAGATION, AND THE ABSOLUTE VALUE OF THE REDUCED WAVE NUMBER.

UNCLASSIFIED

USSR

UDC 612.821.3+591.51

FIRSOV, L. A., Primate Behavior Group, Institute of Physiology imeni  
I. P. Pavlov, Academy of Sciences USSR, Leningrad

"The Function of Memory and the Organization of Behavior in Monkeys and Apes"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov, Vol 23,  
Vyp 4, Jul/Aug 73, pp 711-718

Abstract: The author begins by reviewing the evidence for short-term memory differences among primate species, contrasting them to the time of imprinted conditioned reflex formation, which is the same from fish through apes. It is suggested that short- and long-term memory should be considered different aspects of one process and that a delayed reaction can be treated as a spatial choice while an imprinted conditioned reflex can be treated as a temporal choice. The connection between behavior and memory reserves is emphasized. The author then describes in some detail experiments in delayed anticipation in chimpanzees performed in his laboratory, which he says show that the Konorsky test and the conditioned reflex system are very similar, and perhaps functional mechanisms of long-term memory. On the basis of many experiments the author considers the plasticity of primate behavior to be a

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USSR

FIRSOV, L. A., Zhurnal Vysshey Nervnoy Deyatel'nosti imeni I. P. Pavlov,  
Vol 23, Vyp 4, Jul/Aug 73, pp 711-718

result of the use of conditioned reflex reserves and the selective mobilization of the memory apparatus. He also hypothesizes that elementary abstractions formed by these species are a special form of the function of generalization.

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USSR

UDC 669.71.049.6

PINCHUK, Ya. M., and FIRSANOVA, I. A.

"Mechanism and Thermodynamics of the Removal of Aluminum Oxide Film From an Aluminum Surface During the Distillation of Aluminum in Vacuum Through Subhalides"

Elektron. tekhnika. Nauchno-tekhn. sb. Materialy (Electronic Engineering: Collection of Scientific and Technical Works on Materials), 1970, vyp. 2, pp 16-19 (from RZh-Metallurgiya, No 12, Dec 70, Abstract No 12 G232 by authors)

Translation: Thermodynamic calculations of the reactions in the interaction of  $Al_2O_3$  with aluminum, as well as experimental investigations, showed that the removal of  $Al_2O_3$  film from the surface of molten aluminum takes place due to its interaction with aluminum vapor, with the formation of gaseous  $Al_2O$ . Two tables. Bibliography of 11 titles.

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1/3 019  
UNCLASSIFIED  
TITLE--GAMMA RAY SPECTRA FROM THE, N, GAMMA, REACTION FOR THERMAL NEUTRONS  
IN GERMANIUM 70, GERMANIUM 72, AND GERMANIUM 73 NUCLEI -U-  
AUTHOR-(03)-RUDAK, E.A., FIRSAY, YA.I., KHILMANOVICH, A.M.  
PROCESSING DATE--30OCT70  
COUNTRY OF INFO--USSR  
SOURCE--VESTI AKAD. NAVUK BELARUS. SSR, SER. FIZ.-MAT. NAVUK 1970, (1),  
95-100  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY  
TOPIC TAGS--GAMMA SPECTRUM, NEUTRON ABSORPTION, RADIATIVE CAPTURE,  
GERMANIUM ISOTOPE, GAMMA TRANSITION, ELECTRON STRUCTURE, NUCLEAR SPIN,  
NUCLEAR ENERGY LEVEL, LINE INTENSITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1993/1963  
STEP NO--UR/0428/70/000/001/0095/0100  
CIRC ACCESSION NO--AP0114377  
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--30OCT70

2/3 019

CIRC ACCESSION NO--AP0114377

ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE SPECTRA OF GAMMA RAY EMISSION IN THE REACTIONS  ${}^{70}\text{Ge}(n, \gamma){}^{71}\text{Ge}$ ,  ${}^{72}\text{Ge}(n, \gamma){}^{73}\text{Ge}$ , AND  ${}^{73}\text{Ge}(n, \gamma){}^{74}\text{Ge}$  FOR THE ACTION OF THERMAL N ON THE SEPD. ISOTOPES  ${}^{70}\text{Ge}$ ,  ${}^{72}\text{Ge}$ , AND  ${}^{73}\text{Ge}$  WERE DETD. BY USING A MAGNETIC COMPTON SPECTROMETER. AN EXPTL. TECHNIQUE DESCRIBED IN EARLIER WORK BY RUDAK AND FIRSOV WAS APPLIED. SCHEMES OF GAMMA TRANSITIONS IN THE NUCLEI OF THE 3 GE ISOTOPES UPON CAPTURING A N ARE GIVEN. IN THE TRANSITION FROM ZN ISOTOPES TO GE AND SE ISOTOPES, THE 2P SUBSHELL HALF N SUBSHELL BECOMES COMPLETELY FILLED AND FILLING OF THE 1G SUBSHELL BEGINS. THIS IS REFLECTED IN THE SYSTEM OF ENERGY LEVELS ON NUCLEI AND THE SCHEMES OF ENERGY RELEASE BY NUCLEI ACTIVATED IN THE (N, GAMMA) REACTION AND DECAYING FROM THE INITIAL STATE. IN ADDN. TO LEVELS WITH LOW SPIN VALUES, LEVELS WITH HIGH VALUES OF THE SPIN APPEAR. THUS, THE GROUND STATE OF  ${}^{73}\text{Ge}$  HAS THE CHARACTERISTIC (NINE HALVES) PRIME POSITIVE AND THE INITIAL STATE ON CAPTURING A N BY  ${}^{72}\text{Ge}$  THAT OF (ONE HALF) PRIME POSITIVE. SIMILARLY, ON CAPTURE OF A THERMAL N BY THE  ${}^{73}\text{Ge}$  NUCLEUS AND INITIAL STATE WITH THE SPIN 4 PRIME POSITIVE, 5 PRIME POSITIVE, IS FORMED. THE GREAT DIFFERENCE BETWEEN THE SPIN VALUES OF THE GROUND AND INITIAL STATE INCREASES THE MEAN AMT. OF GAMMA QUANTA PER CAPTURED N (4.0 AND 4.6 FOR  ${}^{73}\text{Ge}$  AND  ${}^{74}\text{Ge}$ , RESP.). IN THE RANGE OF MASS NOS. A CONGRUENT TO 70, THE N FORCE FUNCTION DECREASES.

UNCLASSIFIED

3/3 019

UNCLASSIFIED

PROCESSING DATE--30JCT70

CIRC ACCESSION NO--AP0114377

ABSTRACT/EXTRACT--ALTHOUGH THE GAMMA TRANSITIONS OF NUCLEI TAKE PLACE ESSENTIALLY AFTER CAPTURE OF THERMAL N ON P LEVELS, THE PART PLAYED BY THE DIRECT CAPTURE OF N IS CONSIDERABLY REDUCED VS. NUCLEI WITH A CONGRUENT TO 50. THIS IS INDICATED BY A DECREASE IN THE INTENSITIES OF GAMMA LINES WITH HIGH ENERGIES. FACILITY: INST. FIZ., MINSK, USSR.

UNCLASSIFIED

USSR

UDC 621.391.823(088.8)

F  
FIRSENKOV, A. I., ISHUTKIN, V. M.

"Industrial Radio Noise Simulator"

USSR Author's Certificate No 251083, Filed 24 Nov 67, Published 26 Jan 70  
(from RZh-Radiotekhnika, No 9, Sep 70, Abstract No 9A119P)

Translation: This author's certificate introduces an industrial radio interference simulator in which the gaussian pulse generator is connected in series with an n-bit binary random number transmitter have  $2\sqrt{2^n} - 1$  outputs, an amplitude converter formed by a set of  $2\sqrt{2^n} - 1$  channels each of which contains series connected pulse shapers and voltage dividers, and with an output attenuator. The design of the simulator permits us to obtain a logarithmically normal probability distribution law for the output flux pulse amplitudes.

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Acc. Nr:

AP 0047683

Abstracting Service:  
CHEMICAL ABST. 5/70

Ref. Code:

4R 0032

104772f Determination of the size of a deformed layer in germanium after polishing. Vishnevskii, A. S.; Datsenko, L. I.; Firshteyn, L. A. (Inst. Sverkhiverdnykh Mater., Kiev, USSR). *Zavod. Lab.* 1970, 36(1), 33-5 (Russ). A double crystal spectrometer is used to follow the broadening of the swaying curve of the  $hkl$  reflection which is responsible for the existence of nonorientated mosaic blocks. The 28-30 half-width of the reflection curve  $[111]$ , obsd. on a surface treated many times with an etching agent, is taken as the criterion for the absence of a deformed layer. In order to decrease the exptl. error due to non-coincidence of the at. plane with that of the sample, an adjustment of the sample crystal is made which consists in giving the crystal such a position that the angle  $\theta$  between the incident ray direction and that of the sample plane is  $\theta = \theta_B + \alpha$ , where  $\theta_B$  is the tabular value of the Bragg angle for the given reflection and  $\alpha$  the max. angle of deflection of the sample plane from the at. one. The dependence of the half-width of the  $[111]$  reflection on the deformed layer thickness found during stepwise etching is presented.

J. Hejduk

REEL/FRAME  
19791259

187c

USSR

UDC 547.438.1+547.26'118+543.226

PUDOVIK, A. N., KONOVALOVA, I. V., ROMANOV, G. V., FIRSEVA, R. G., and  
BURMISTROVA, N. P.

"Study of Phosphonate-phosphate Regrouping and the Processes accompanying It  
by the Differential Thermal Analysis Method with Simultaneous Recording of  
the Electrical Conductivity"

Leningrad, Zhurnal Obshchey Khimii, Vol XLIII (CV), No 1, 1973, pp 41-45

Abstract: The study of phosphonate-phosphate regrouping and the processes  
accompanying it by the thermographic method with simultaneous recording of  
the electrical conductivity is continued. The thermal behavior of a series  
of  $\alpha$ -oxyalkyl phosphonates and substituted  $\alpha$ -oxyethylphenyl phosphonic  
acids was studied. The thermal conversion of  $\alpha$ -oxyalkylphosphonates and  
their analogs was preceded by ionization of the hydroxyl group on the  $\alpha$ -carbon  
atom. The study was made of the mechanism of thermal phosphonate-phosphate  
regrouping.

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USSR

UDC: 621.315.3

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FARMAKOVSKIY, B. V., AFONINA, L. G., VAKHRAMEYEV, V. I., LEYANOVA, S. V.,  
KRASIK, N. Ya., FIRSOV, A. M.

"Thermoresistive Cast Microwires in Glass Insulation"

Elektron. tekhnika. Nauchno-tekhn. sb. Radiokomponenty (Electronic Technology.  
Scientific and Technical Collection. Radio Components), 1970, vyp. 1, pp 77-82  
(from RZh-Radiotekhnika, No 5, May 71, Abstract No 5V416)

Translation: The authors present the technological properties of thermo-  
resistive alloys and the results of an investigation of the properties of  
microwires made from resistive alloy based on nickel with a temperature coef-  
ficient of resistance of  $(5-6) \cdot 10^{-3} \%$ /deg. Resumé.

1/1

1/2 031 UNCLASSIFIED PROCESSING DATE--02OCT70  
TITLE--TEMPERATURE COMPENSATING ALLOY -U-

AUTHOR--(05)-AFONINA, L.G., FLYSOV, A.M., DEYANOVA, S.V., VAKHRAMEYEV,  
V.I., FARMAKOVSKIY, B.V.  
COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 260, 892  
REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,  
DATE PUBLISHED--06JAN70

SUBJECT AREAS--MATERIALS

TOPIC TAGS--METALLURGIC PATENT, TIN ALLOY, NICKEL, SILICON, BORON, ALLOY  
COMPOSITION, THERMAL EFFECT

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1990/1791

STEP NO--UP/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0109752

UNCLASSIFIED



2/2 031  
CIRC ACCESSION NO--AA0109752

UNCLASSIFIED

PROCESSING DATE--02OCT70

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THERMOCOMPENSATION ALLOY CONSISTS  
OF NI 0.5-3, SI 0.5-3, B 0.01-0.1PERCENT, AND SN THE REMAINDER.

89

UNCLASSIFIED

1/2 026 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--SCATTERING OF ELASTIC MODES IN A PLATE WITH A TWO DIMENSIONAL  
DISTRIBUTION OF SURFACE IRREGULARITIES -U-  
AUTHOR--(02)-MERKULOV, L.G., FIRSOV, I.P.                      F  
COUNTRY OF INFO--USSR  
SOURCE--MOSCOW, AKUSTICHESKIY ZHURNAL, VOL 16, NO 1, 1970, PP 100-115  
DATE PUBLISHED-----70  
SUBJECT AREAS--PHYSICS  
TOPIC TAGS--FLAT PLATE, VIBRATION PROPAGATION, FOURIER TRANSFORM, ACOUSTIC  
SCATTERING, SURFACE ROUGHNESS, CALCULATION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1988/1897 STEP NO--UR/0046/70/016/001/0110/0115  
CIRC ACCESSION NO--AP0106558  
UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0106558

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE FOURIER INTEGRAL TRANSFORMATION METHOD WAS USED TO SOLVE THE PROBLEM OF THE PASSAGE OF ELASTIC MODES ACROSS A SECTION OF A PLATE IN THE FORM OF AN INFINITE BAND WITH TWO DIMENSIONAL DISTRIBUTION OF SURFACE IRREGULARITIES. THE DEPTHS OF THE IRREGULARITIES AND THE ANGLES OF INCLINATION THEY FORMED ARE ASSUMED TO BE SMALL, WHICH MAKES IT POSSIBLE TO CONFINE THE PROBLEM TO THE FIRST APPROXIMATION WHEN FINDING THE POTENTIALS OF THE SCATTERED WAVES. A TOTAL CALCULATION WAS MADE FOR THE CASE OF THE INCIDENCE OF A SYMMETRICAL LAMB WAVE. THE SCATTERED FIELD IS REPRESENTED AS THE SUM OF THE LAMB AND SHEAR MODES (PROPAGATED AT DIFFERENT ANGLES WITH RESPECT TO THE ANGLE OF INCIDENCE), WHOSE SYMMETRY IS DETERMINED BY THE SYMMETRY OF THE SURFACE IRREGULARITIES. FACILITY: LENINGRAD ELECTRICAL ENGINEERING INSTITUTE IMENI V. I. UL'YANOV LENIN. FACILITY: TAGANROG RADIOTECHNICAL INSTITUTE.

UNCLASSIFIED

F

USSR

UDC 534.121.1

MERKULOV, L. G. and FIRSOV, I. P., Leningrad Electrical Engineering Institute  
imeni V. I. Ul'yanov (Lenin) and Taganrog Radiotechnical Institute

"Scattering of Elastic Modes in a Plate with a Two-Dimensional Distribution  
of Surface Irregularities"

Moscow, Akusticheskiy Zhurnal, Vol 16, No 1, 1970, pp 110-115

Abstract: The Fourier integral transformation method was used to solve the problem of the passage of elastic modes across a section of a plate in the form of an infinite band with two-dimensional distribution of surface irregularities. The depths of the irregularities and the angles of inclination they formed are assumed to be small, which makes it possible to confine the problem to the first approximation when finding the potentials of the scattered waves. A total calculation was made for the case of the incidence of a symmetrical Lamb wave. The scattered field is represented as the sum of the Lamb and shear modes (propagated at different angles with respect to the angle of incidence), whose symmetry is determined by the symmetry of the surface irregularities.

1/1

USSR

F UDC 612.833.81+612.821.2

FIRSOV, L. A., Group for the Study of Higher Nervous Activity of Monkeys, Institute of Physiology imeni I. P. Pavlov, Academy of Sciences USSR

"Dynamic Interaction of Long-Term and Short-Term Memory in Chimpanzees and Monkeys"

Moscow, Zhurnal Vysshey Nervnoy Deyatel'nosti, No 1, 1970, pp 64-70

Abstract: The interaction of long-term memory (stable conditioned reflex) and short-term memory (visual image of a natural food stimulus) under conditions of experimental conflict (sudden switching over of a negative conditioned signal to a positive one after a delayed reaction was studied. The visual image was highly unstable and readily inhibited by the conditioned reflex in monkeys, but in chimpanzees the visual image persistently dominated the conditioned reflex (especially in the tests with 20-30 sec delays).

1/1

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1/2 014 UNCLASSIFIED PROCESSING DATE--18SEP70  
TITLE--DYNAMIC INTERACTION BETWEEN THE RESERVE AND OPERATING MEMORY IN  
APES AND MONKEYS -U-  
AUTHOR--FIRSOV, L.A.  
COUNTRY OF INFO--USSR  
SOURCE--ZHURNAL VYSSHEY NERVNOY DEYATEL'NOSTI, 1970, VOL 20, NR 1 PP 64-70  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--MEMORY, MONKEY, PRIMATE  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAE--1982/0794 STEP NO--UR/0247/70/020/001/0064/0070  
CIRC ACCESSION NO--AP0052231

UNCLASSIFIED

2/2 014

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--AP0052231

ABSTRACT/EXTRACT--(U) GP-O- ABSTRACT. A STUDY WAS MADE ON MONKEYS AND ANTHROPOID APES OF THE INTERACTION BETWEEN LONG AND SHORT TERM MEMORY UNDER CONDITIONS OF EXPERIMENTAL CONFLICT (SUDDEN SWITCHING OVER OF A NEGATIVE CONDITIONED SIGNAL TO A POSITIVE ONE BY MEANS OF DELAYED REACTION). THE DATA SO OBTAINED POINT TO A PROGRESSIVE DEVELOPMENT OF OPERATIVE TRACE PROCESSES (OF MEMORY) IN THE COURSE OF EVOLUTION OF PRIMATES.

UNCLASSIFIED

1/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70  
TITLE--VOCAL BEHAVIOR IN LOWER AND HIGHER MONKEYS -U-  
AUTHOR--FIRSOV, L.A. F  
COUNTRY OF INFO--USSR  
SOURCE--VOPROSY PSIKHOLOGII, 1970, NR 3, PP 113-125  
DATE PUBLISHED-----70  
SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES  
TOPIC TAGS--MONKEY, VOICE COMMUNICATION, VERBAL BEHAVIOR  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--3001/1160 STEP NO--UR/0402/70/000/003/0113/0125  
CIRC ACCESSION NO--AP0126763  
UNCLASSIFIED



2/2 018 UNCLASSIFIED PROCESSING DATE--13NOV70  
CIRC ACCESSION NO--AP0126763  
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. VOCAL COMPONENTS OF THE  
COMMUNICATIVE SYSTEM OF LOWER AND HIGHER MONKEYS WERE STUDIED IN  
CONDITIONS OF UNRESTRAINED BEHAVIOR AS WELL AS IN EXPERIMENTS. TAPE AND  
OXCILLOGRAPHIC RECORDINGS WERE USED FOR THE IDENTIFICATION OF VOCAL  
REACTIONS. THE INVESTIGATION SHOWED THAT AN ATTEMPT TO CONSIDER VOCAL  
REACTIONS AS STATIC PHENOMENA MAY LEAD INTO ERRORS AND TO UNLOGICAL  
CONSTRUCTIONS. THESE REACTIONS ARE, IN FACT, VERY DYNAMIC AND,  
THEREFORE, ARE OF BIOLOGICAL IMPORTANCE AS A MEANS OF GREGARIOUS  
ADAPTATION. IN THIS ASPECT THE TERM VOCAL INTERCOURSE MUST BE  
CONSIDERED AS INCORRECT ONE, SINCE THERE IS NO ACTIVE TRANSMISSION OF  
INFORMATION IN MONKEYS (AS IN OTHER ANIMALS). IN VOCAL REACTIONS OF  
MONKEYS THERE MANIFEST ITSELF THE UNINTENTIONAL VOCAL PRODUCTION OF SOME  
INDIVIDUALS WHICH SERVES AS A SYSTEM OF SIGNALS FOR THE OTHERS. THE  
INCLUSION OF THE VOCAL COMPONENT INTO THIS OR THAT SCHEME OF BEHAVIOR IS  
CONNECTED WITH THE SELECTIVE INCREASE OF EXCITATION IN A DOMINANTING  
CONDITIONED, UNCONDITIONED SYSTEM. FACILITY: INSTITUT  
FIZIOLOGII IM. I. P. PAVLOVA AN SSSR, LENINGRAD.

UNCLASSIFIED

USSR

UDC 621.771.35:621.382.1

MONID, A. G., GRINBERG, D. L., SPOLENIKO, V. P., FIKSOV, P. A., and IONOV, I. A., Cherepovets Metallurgical Plant; Vologda State Pedagogical Institute

"Anticorrosion Protection of Steel Sheets"

Moscow, Metallurg, No 9, Sep 70, pp 33-34

Abstract: A study was made of the effectiveness of the anticorrosion protection of sheet steel using inhibitor oils. The study was prompted by the multitude of complaints lodged by consumers and plants. The latter have been shipped both cold- and hot-rolled steel sheets with corrosion defects. The project called for the development of an anticorrosion protection for hot-rolled, cold-rolled, and galvanized steel using inhibitor oils. Industrial oil-20 was mixed with NC-203 and NC-204 and lubricants PP54/5 in concentrations of 10, 20, and 30%. Samples of 08 kp steel treated with oil containing additive of NC-203 and PP54/5 inhibitors in concentrations of 10-30% passed 15 days of open-air testing. The treated metals were also subjected to accelerated tests which consisted of dipping in water for 8 hours at 40°C followed by holding in air for 16 hours. The cycle was repeated 5 times. Use was made of a potentiodynamic method to determine corrosion protection. The outcome of the study was a number of samples of anticorrosion lubricants comprising oil-20 with additives of NC-203 and PP54/5.

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USSR

MONID, A. G., et al, Metallurg, No 9, Sep 70, pp 33-34

inhibitors, construction of mixer equipment, and development of a coating technology.

2/2

USSR

UDC 541.12.012.2

ANDRIANOV, D. G., OBUKHOV, YU. V., FIRSOV, V. G., FISTUL', V. I., State Scientific Research and Development Institute of Rare Metal Industry, Institute of Theoretical and Experimental Physics, Moscow

"Dimensions of the Hydrogen Atom in Semiconductors and Dielectrics"

Moscow, Doklady Akademii Nauk SSSR, Vol 201, No 4, Dec 71, pp 884-886

Abstract: A theoretical discussion based on literature reports is carried out in an attempt to find correlations between the Si-H and Ge-H bond characteristics and dimensions of atomic Monium and atomic hydrogen (both by physical and chemical properties an atom of Monium is like a hydrogen atom). No original experimental work is reported. It is believed that the Monium (and consequently the atomic hydrogen) are located in the internodal spaces of the crystalline lattice of germanium and silicon. The Monium was found to have a decreased energy of superfine interactions which is believed to be due to its interaction with neighboring atoms in the crystalline lattice -- evidently the Monium electron belongs for a certain time concurrently to the  $\mu^+$ -meson and to the ligand. Geometrical characteristics of the internodal spaces in which the Monium and hydrogen are located in the

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USSR

ANDRIANOV, D. G., et al., Doklady Akademii Nauk SSSR, Vol 201, No 4,  
Dec 71, pp 884-886

Ge and Si lattices are about the same, analogously to the Ge-H, Si-H bond lengths. If the interaction of  $\mu$ onium with the ligands of silicon and germanium lattice resembles the interaction during formation of Si-H and Ge-H bonds, it is reasonable to expect that the  $\mu$ onium should be larger in the silicon lattice than in the germanium lattice. A conclusion is reached that the radius of hydrogen dissolved in silicon should be somewhat larger than in germanium.

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USSR

UDC 621.373.826

SKVORTSOV, B. V., FIRSOV, V. M., MIUSKIN, V. YE., KURITSYN, I. A.

"Gas Discharge Pulse Tube for Pumping Lasers"

USSR Author's Certificate No 292568, filed 1 Nov 67, published 30 Nov 71 (from RZh-Radiotekhnika, No 5, May 72, Abstract No 5D286P)

Translation: A gas discharge pulse tube for pumping lasers has been patented the bulb of which is executed from quartz glass with alloying substances injected in it. In order to vary the structural characteristics of the tube radiation in such a way that it will correspond to the absorption (excitation) spectrum of the active substance and increase the energy supplied to the active substance without increasing its operating temperature, the sesquioxides of elements of the lanthanide group are used as the alloying substances.

1/1

USSR

UDC 669.71.042.6

KUZNETSOV, K. I., GENISARETSKIY, M. A., GOROKHOV, V. P., SKUCHILOV, A. I.,  
SHCHEGLOV, D. A., FIRSOV, V. M., KOZLOV, K. A.

"Development and Assimilation of Continuous Casting of Large Aluminum Ingots"

Tekhnol. Legkikh Splavov. Nauchno-tekhn. Byul. VILSa [The Technology of Light Alloys, Scientific and Technical Bulletin of the All-Union Institute of Light Alloys], 1970, No. 6, pp. 91-95. (Translated from Referativnyy Zhurnal Metal-lurgiya, No. 5, 1971, Abstract No. 5 G139 by G. Svodtseva).

Translation: The equipment and technology for casting large T-shaped ingots (I) of Al weighing 1 t were developed in 1963-1964 at the SMK (expansion unknown -- possibility: Siberian Metallurgical Combine). In 1969-1970, about 10,000 tons of large I were processed. The use of these I by metallurgical plants to replace the 15-kg I provides for: 1) complete elimination of manual labor in all loading and unloading operations from casting of I at the manufacturer to charging in the melting furnaces of metallurgical plants; 2) reduction in labor consumption by consumers during unloading of I from railroad cars by a factor of 4 by using lift trucks; 3) halving of storage area requirements; 4) reduction in labor consumption involved in transportation of I from railroad car to casting shop by 1.3 times; 5) reduction in labor consumption during charging into furnace by a factor of 2; 6) reduction in requirements for charging boxes by 40%; 7) reduction in melting time by 10-15%; 8) improvement of quality of metal of I

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USSR

UDC 669.71.042.6

KUZNETSOV, K. I., GENISARETSKIY, M. A., GORONKHOV, V. P., SKUCHILOV, A. I.,  
SHCHEGLOV, D. A., FIRSOV, V. M., KOZLOV, K. A., Tekhnol. Legkik Splavov.  
Nauchno-tekhn. Byul. VILSa, 1970, No. 6, pp. 91-93.

as a result of decreased gas content and increased metal purity with continuous casting. The ratio of the surface area of large I to volume is 6 times lower than that of 15 kg I as a result of which the charge includes less oxide film, which also improves the quality of the metal.

2/2



1/2 025 UNCLASSIFIED  
TITLE--SEMICONDUCTOR GAMMA SPECTROMETER -U-

PROCESSING DATE--30OCT70

AUTHOR--(02)-NEGREY, S.A., FIRSOV, YE.I.

COUNTRY OF INFO--USSR

SOURCE--PRIB. TEKH. EKSP. 1970, 1, 44-6

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, ELECTRONICS AND ELECTRICAL ENGR.

TOPIC TAGS--SEMICONDUCTOR DEVICE, GAMMA SPECTROMETER, COBALT ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRA--1989/1888

STEP NO--UR/0120/70/001/000/0044/0046

CIRC ACCESSION NO--AP0108218

UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0108218

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A GAMMA SPECTROMETER WITH A GE(LI) DETECTOR IS DESCRIBED. THE VOL. OF THE DETECTOR IS 2.7 CM PRIME3. THE SPECTROMETER HAS A 0.5PERCENT RESOLN. FOR PRIME60 CO GAMMA RADIATION. GE GDD-10-40 WITH A SP. RESISTANCE 10-20 OHM-CM AND A DISLOCATION D. OF SIMILAR TO 3 TIMES 10 PRIME3-CM PRIME2 WAS USED. ETCHING OF THE SPECIMENS WAS DONE IN A SOLN. OF 3 PARTS OF 70PERCENT HNO SUB3 AND 1 PART 48PERCENT H SUB2 F SUB2 WITH 1 DROP OF AQ. SOLN. OF BR (10 G-L.) PER 50 ML OF THE ETCHING SOLN. THE N,PENTANE WAS USED FOR PERFORMING THE DRIFT OF LI IN GE AT 500 V ON THE DIODE. EQUALIZATION OF CAPACITANCE WAS ACCOMPLISHED IN A CRYOSTAT WITH A BIAS OF 400 V AND A CURRENT OF ONE THIRD OF THE CURRENT FLOW THROUGH THE DIODE AT ROOM TEMP. FACILITY: INST. FIS., MINSK, USSR.

UNCLASSIFIED

F Nuclear Physics

USSR

RUDAK, E. A., FIRSOV, YE. I., KHIL'MANOVICH, A. M., Institute of Physics, Academy of Sciences, Belorussian SSR

"The  $\gamma$ -Ray Spectrum From the Reaction of  $\text{Se}^{74}$  ( $n, \gamma$ )  $\text{Se}^{75}$  on Thermal Neutrons

Moscow, Yadernaya Fizika, Vol 11, No 6, 1970, pp 1129-1132

Abstract: The  $\text{Se}^{75}$  nucleus is one of the least studied nuclei. Some information concerning level decay with an energy of less than 1.2 Mev has been obtained from data concerning the radioactive decay of  $\text{Br}^{75}$ . Only one study is known that deals with research on the (d,p)-reaction on a specimen with poor enrichment with respect to the  $\text{Se}^{74}$  isotope. Data concerning energies and quantum characteristics of levels with an energy greater than 1.2 Mev are virtually absent. In this connection, research on the  $\text{Se}^{74}$  ( $n, \gamma$ )  $\text{Se}^{75}$  reaction is of definite interest, since it permits information to be obtained concerning the little-studied levels of the  $\text{Se}^{75}$  nucleus. In the present study, the  $\gamma$ -ray  
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USSR

RUDAK, E. A., et al, Yadernaya Fizika, Vol 11, No 6, 1970,  
pp 1129-1132

spectrum from the reaction of  $\text{Se}^{74}$  ( $n, \gamma$ )  $\text{Se}^{75}$  on thermal neutrons was studied by means of a magnetic Compton spectrometer with a resolution of 2% on the IRT reactor of the Academy of Sciences, Belorussian SSR. A diagram of  $\gamma$ -transitions of the  $\text{Se}^{75}$  nucleus from the initial state in the ( $n, \gamma$ ) reaction is proposed.

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1/2 019 UNCLASSIFIED PROCESSING DATE--30OCT70  
TITLE--GAMMA RAY SPECTRUM FROM THE ,N, GAMMA, REACTION BASED ON THERMAL  
NEUTRONS IN A NATURAL MISTURE OF MAGNESIUM ISOTOPES -U-  
AUTHOR-(03)-RUDAK, E.A., FIRSOV, YE.I., KHILMANOVICH, A.M.

CCOUNTRY OF INFO--USSR

SOURCE--VESTSI AKAD. NAVUK BELARUS. SSR, SER. FIZ.-MAT. NAVUK 1970, (1),  
125-6

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--RADIATIVE CAPTURE, GAMMA SPECTRUM, THERMAL NEUTRON, NEUTRON  
ABSORPTION, MAGNESIUM ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--1992/0064

STEP NO--UR/0428/70/000/001/0125/0126

CIRC ACCESSION NO--AP0111258

UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0111258

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GAMMA RAY SPECTRUM OF A MO ROD  
WAS STUDIED (DIAM. 5 CM, AND WEIGHT 1700 G) BY THE METHOD DESCRIBED  
PREVIOUSLY (RUDAK, ET AL., 1965). FACILITY: INST. FIZ., MINSK,  
USSR.

UNCLASSIFIED

USSR

UDC: 621.372.852.1

FIRSOV, Ye. L., MEL'NIK, A. I., BOBYSHEV, V. M.

"A Measurement Cavity for an Electron Paramagnetic Resonance Spectrometer"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 7, Mar 72, Author's Certificate No 329655, Division H, filed 30 Jun 70, published 9 Feb 72, p 221

Translation: This Author's Certificate introduces a measurement cavity for an electron paramagnetic resonance spectrometer. As a distinguishing feature of the patent, the space factor of the cavity is optimized, and the sensitivity of the spectrometer is accordingly maximized when studying specimens with high dielectric losses by partially shielding the specimen from the electromagnetic field of the cavity. Shielding is accomplished by two sections of current-conducting tube or a conductive helix if the cavity is rectangular, and by the inner conductor of the cavity if it is coaxial.

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Acc. Nr: AP0043776 **FIRSON** **Yu A** Ref. Code: UR 0056PRIMARY SOURCE: Zhurnal Eksperimental'noy i Teoreticheskoy  
Fiziki, 1970, Vol 58, Nr 3, pp 1025-1039LOCAL OSCILLATIONS IN AN IONIC CRYSTAL  
IN THE PRESENCE OF A LONG RANGE DEFECTV. V. Bryksin, Yu. A. Firson

Differential equations are derived, the eigen values of which define the spectrum of local oscillations in the phonon spectrum in the presence of a long range (charged) defect in an ionic crystal. The method proposed is similar to the effective mass method for calculation of small impurity donor and acceptor levels. The equations are used for estimating the number of levels of local oscillations which drop out of the longitudinal optical phonon branch in the case of isotropic space. For certain values of the parameters of the theory the defect may be a scattering center for longwave phonons, its cross section being much greater than the square of the lattice constant. After a simple modification of the equations (terms containing the electric field are excluded) they are also valid for the case of defects in homopolar crystals in which oscillations of the type considered may appear in the phonon spectrum due to anharmonism forces.

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REEL/FRAME  
19770184

1/24



1/2 023 UNCLASSIFIED PROCESSING DATE--20NOV70  
TITLE--MICROLEVEL EXAMINATION OF LOCAL VIBRATIONS IN AN IONIC CRYSTAL IN  
THE PRESENCE OF A LONG RANGE DEFECT -U-  
AUTHOR--(02)-BRYKSIN, V.V., FIRSUV, YU.A.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TVERD. TELA 1970, 12(4), 1020-7

DATE PUBLISHED-----70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--MATHEMATIC EXPRESSION, VIBRATION SPECTRUM, IONIC CRYSTAL,  
CRYSTAL LATTICE DEFECT

CENTREL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAE--3005/1417

STEP NO--UR/0181/70/012/004/1030/0137

CIRC ACCESSION NO--AP0133369

UNCLASSIFIED

2/2 023

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0133369

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY CONSIDERING THE EQUATIONS OF MOTION OF AN IONIC LATTICE IN THE ANHARMONIC APPROXN. IN THE PRESENCE OF ELEC. CHARGED DEFECTS, DIFFERENTIAL EQUATIONS WERE OBTAINED THE PROPER VALUES OF WHICH DET. THE SPECTRUM OF FINE LEVELS OF THE LOCAL VIBRATIONS. THE CONSTS. OF THESE EQUATIONS ARE EXPRESSED BY MEANS OF MICROLEVEL PARAMETERS. FACILITY: INST. POLUPROV., LENINGRAD, USSR.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--23OCT70  
TITLE--THERMODYNAMIC STUDY OF THE TRANSITION OF ADSORBED BENZENE TO A  
CRYSTALLINE STATE -U-  
AUTHOR-(05)-BEREZIN, G.I., KISELEV, A.V., KOZLOV, A.A., KUZNETSOVA, L.V.,  
FIRSOVA, A.A.  
COUNTRY OF INFO--USSR  
SOURCE--ZH. FIZ. KHIM. 1970, 44(2), 541-3  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--BENZENE, CRYSTAL, HEAT CAPACITY, ADSORPTION  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRA--1995/1422 STEP NO--UR/0076/70/044/002/0541/0543  
CIRC ACCESSION NO--AP0116869  
UNCLASSIFIED

2/2 019

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0116869

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TRANSITION OF C SUB6 H SUB6, ADSORBED IN A POROUS ADSORBENT, FROM THE STATE OF CAPILLARY CONDENSATE TO A CRYST. PHASE OCCURS AT 0 TO MINUS 50DEGREES. THIS WAS EVIDENCED BY A SHARP MAX. IN THE TEMP. DEPENDENCE OF THE HEAT CAPACITY OF ADSORBENT CONTG. C SUB6 H SUB6 IN THE ABOVE TEMP. INTERVAL. THE TRANSITION OF ADSORBED C SUB6 H SUB6 TO THE CRYST. PHASE IS ACCOMPANIED BY A SHARP DECREASE IN THE MAX. ADSORPTION CAPACITY A SUBS. THE VALUES A SUBS WERE VIRTUALLY CONST. BELOW AND ABOVE THE TEMP. INTERVAL OF PHASE TRANSITIONS. FACILITY: INST. FIZ. KHIM., MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 621.314.57

SOKOLOV, S.D., BEY, YU.M., DOBROVOL'SKIS, T.P., LUPYAN, A.G., FIRSOVA, L.D.,  
AYZENSHTEYN, L.S., GURAL'NIK, YA. D.

"System Of Control Of Thyristorized Inverter"

Tr. VNII Zh.-d. transp. (Works Of The All-Union Scientific-Research Institute Of  
Railroad Transportation), 1970, Issue 420, pp 69-75 (from RZh--Elektronika i yeye  
primeneniye, No 4, April 1971, Abstract No 43665)

Translation: The paper describes a system of control of thyristorized converters  
[sic] arranged according to the circuit "two reverse stars with an equalizing re-  
actor" or according to a 3-phase bridge scheme which assures turn-on of a large  
number of series-parallel connected thyristors. In the control circuit, individual  
(for each thyristor) output current transformers are used. This assures high  
efficiency and makes it possible to obtain identical currents through the thyris-  
tor gates with a considerable dispersion of their input characteristics. The cir-  
cuit for pulse shaping consists of two 3-loop networks and a discharge thyristor.  
The first loop produces a steep initial burst, and the remainder the necessary  
duration of the control pulse. The experimental characteristics are considered  
of the pulse shapers with various parameters of the current of the output trans-  
formers, parameters of the thyristors, and length of the connecting conductors.  
A block diagram is presented of the modeling on an analog computer of the system  
for control of thyristors. 10 ill. 2 tab. 4 ref. L.R.

Instruments and Measurements

USSR

UDC: 621.316.92:621.314.6

FIRSOVA, I. D., SOKOLOV, S. D., LUPYAN, A. G., KISHINEVSKIY, R. N., KISELEV, N. M.,  
Design and Planning Office of the Main Administration of Electrification and  
Power Management of the Ministry of Ways of Communication

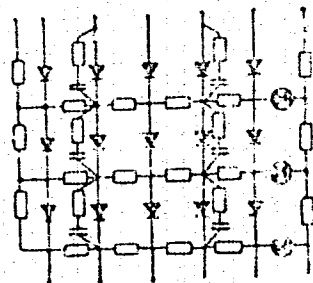
"A Device for Protection and Signalling the Breakdown of Diodes in a Semiconductor  
Rectifier Installation"

Moscow, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 6,  
1970, p 55, patent No 262248, filed 15 Apr 64

Abstract: This Author's Certificate introduces a device for protection and sig-  
nalling the breakdown of diodes in a semiconductor rectifier installation with  
diodes connected in series-parallel. The unit contains shunting resistors and  
signal elements such as light bulbs which act on photoresistors connected in the  
input circuits of protection and alarm. As a distinguishing feature of the  
patent, the operational reliability of the device is improved by connecting the  
signal elements between the common points of groups of parallel-connected diodes  
and shunting resistors.

USSR

FIRSOVA, L. D., et al, Otkrytiya, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 6, 1970, p 55, patent No 262248, filed 15 Apr 64



2/2

1/3 017 UNCLASSIFIED PROCESSING DATE--11SER70  
TITLE--PROCESSING OF STILL RESIDUES OF FURFURAL PRODUCTION -U-  
AUTHOR--BADOVSKAYA, L.A., KULNEVICH, V.G., FIRSOVA, L.I., SHAPIRO, YU.M.,  
KURZIN, M.I.  
COUNTRY OF INFO--USSR  
SOURCE--GIDROLIZ. LESOKHIM. PROM. 1970, 23(2) 23-5  
DATE PUBLISHED-----70  
SUBJECT AREAS--CHEMISTRY  
TOPIC TAGS--FURFURAL, FURAN, PEROXIDE, POLAROGRAPHY, GAS CHROMATOGRAPHY,  
UV SPECTRUM, SUCCINIC ACID, MALEIC ACID, FUMARIC ACID  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAF--1989/0147 STEP NO--UR/0328/70/023/002/0023/0025  
CIRC ACCESSION NO--AP0106809

UNCLASSIFIED



2/3 017

UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106809

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE 2 METHODS PRESENTLY USED FOR PROCESSING RESIDUES FROM FURFURAL RECTIFICATION ARE THE RECOVERY OF FURFURAL (I) AND METHYLFURFURAL (II) AND DECARBONYLATION TO SYLVAN (ALPHA MEHTYL-FURAN). THE METHOD PROPOSED CONSISTS IN OXID. OF THE RESIDUES WITH H SUB2 O SUB2 TO YIELD ORG. ACIDS. ALSO DEVELOPED WAS A NEW METHOD FOR CHEM. ANAL. OF THE RESIDUE, BETTER SUITED FOR INDUSTRIAL CONTROL THAN EITHER POLAROGRAPHY OR GAS CHROMATOG. THE METHOD, WHICH HAS BEEN DESCRIBED ELSEWHERE (SHAPIRO AND KUL'NEVICH, 1969), IS BASED ON UV. SPECTROMETRY AND CALCNS. OF I CONCN. FROM THAT OF A STD. SOLN. AND THE OPTICAL DS. OF THE TEST SAMPLE AND THE STD. SOLN. THE AMT. OF IMPURITIES ARE DETD. FROM DIFFERENTIAL SPECTRA. THE ACCURATE METHOD MAKES POSSIBLE SEP. I AND II DETNS. EVEN IN STRONGLY RESINIFIED MATERIAL. COM. RESIDUES ANALYZED CONTAINED 22-95PERCENT FURALDEHYDES, DEPENDING ON THE RAW MATERIAL AND THE I PRODN. METHOD. THEY WERE OXIDIZED WITH 30PERCENT H SUB2 O SUB2 AT A MOLAR RATIO OF FURALDEHYDES-H SUB2 O SUB2 OF 1:3, A TEMP. OF 64 PLUS OR MINUS 1DEGREE, WITH INTENSE MIXING FOR 4 HR. THE QUAL. AND QUANT. COMPN. OF THE OXID. PRODUCTS WERE ANALYZED BY PAPER, COLUMN, AND THIN LAYER CHROMATOG. OXID. CONVERTED I TO A MIXT. OF CRYST. ACIDS (MALEIC, FUMARIC, AND SUCCINIC). II WAS CONVERTED TO BETA ACETYLACRYLIC (III) AND LEVULINIC ACID (IV). THE RESIDUAL PEROXIDES WERE DECOMP. BY TREATMENT WITH THIUREA (1PERCENT BASED ON THE VOL. OF REACTION PRODUCTS). THE CRYST. ACIDS WERE SEPD. BY RECRYSTN. FROM HOT WATER, AND IV BY DISTN. (70DEGREES-5 MM). IV IS RECOVERED BY EVAPN. OF THE SOLVENT AFTER EXTN.

UNCLASSIFIED

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UNCLASSIFIED

PROCESSING DATE--11SEP70

CIRC ACCESSION NO--AP0106809

ABSTRACT/EXTRACT--THE OVERALL YIELD OF THE ACID WAS 85PERCENT, AND THE PERCENT COMPN. OF THE ACIDS WAS SUCCINIC 28, IV 24, III 26, MALEIC 18, AND FUMARIC 3. HIGHER YIELDS WERE OBTAINED FROM RESIDUES WITH A HIGH INITIAL CONTENT OF ALDEHYDES. SAMPLES WITH LOW ALDEHYDE CONTENT GAVE POOR YIELDS (AT CONTENT 22PERCENT, THE YIELD OF TOTAL ACID WAS 21.6PERCENT.

UNCLASSIFIED

USSR

KISELEV, D. F., and FIRSOVA, M. M., Moscow State University imeni M. V. Lomonosov

"Measurement of the Piezoelectric Coefficients of Lanthanum Niobate by Means of an Interferential Dilatometer"

Leningrad, Fizika Tverdogo Tela, Vol 15, No 1, Jan 73, pp 279-281

Abstract: Measurements were conducted of the static piezoelectric moduli of  $\text{LiNbO}_3$  with the use of the inverse piezoelectric effect; in other words, an investigation was made of the deformation of the specimen under the action of a constant electrical field. The experimental installation is described and illustrated by a schematic diagram. The measurement results are presented in a table, and are compared therein with the data of other authors. Attention is drawn to lack of coincidence among the results of various authors. 1 figure, 1 table, 9 references.

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FIRSOVA, S. A.

Health

DYNAMICS OF SIZE, COMPOSITION, AND DISTRIBUTION OF THE POPULATION OF IVANOVSKAYA OBLAST

Article by S. A. Firsova, Assistant to the Chief, Research Institute of Social Hygiene and Public Health Organization, Institute of Hygiene, Moscow, USSR; Sovetskaya Zdravokhraneniye, Moscow, No. 4, 1972, submitted to Sovetskaya Zdravokhraneniye, No. 4, 1972, pp. 28-31.

Our objective was to evaluate the change in size, composition, and distribution of the population of Ivanovskaya Oblast from the time it was formed and to the present. Investigation of the dynamics of population reproduction in this oblast is of particular interest, since it is among the oblasts where, in connection with the All-Union census of 1970 and in accordance with the decision of the USSR Ministry of Health, special work is being done on the physical condition of the population is in progress.

Ivanovskaya Oblast, with Ivanovo-Voznesensk (Ivanovo since 1919) as its center, was formed by decree of the All-Union Central Executive Committee dated 14 January 1929. Parts of four provinces were included: Yaroslavl, Vladimirskaya, Kostromskaya, and Ivanovo-Voznesenskaya. At that time the size of the territory was 105,000 sq km, which constituted 0.6 percent of the territory of the USSR. It had a population of 4,671,000 or 2.9 percent of the population of the USSR.

Since this oblast was established the territorial administrative boundaries changed several times; at the time of the 1st change (1960) the area diminished to 23,617 sq km and the population constituted 1,190,000.

Direct loss of population, emigration, the destruction of settlements and distribution of productive forces during the Great Patriotic War led to a considerable rise in birth rate, at the time of the 1939 census, the population size constituted 95 percent of the 1939 level, i.e., it was lower than before the war. During the period between the 1959 and 1970 censuses, there was a 1.4 percent rise in population, but it did not reach the prewar level; in 1970, the population of Ivanovskaya Oblast was 3.3 percent smaller than in 1939.

USSR

UDC 669.71.48

VASHCHENKO, K. I., FIRSTOV, A. N., ZHIZHENKO, V. V.

"Improving the Quality of Secondary Aluminum Alloys"

Usadochn. protsessy v splavakh i otlivkakh -- V sb. (Shrinkage Processes and Alloys and Castings -- collection of works), Kiev, Naukova Dumka Press, 1970, pp 274-277 (from RZh-Metallurgiya, No 4, Apr 71, Abstract No 4G196)

Translation: The effect of degassing and refining on the mechanical and casting properties of secondary AL9V and AL10V alloys is investigated. The quality of secondary alloys is improved by effective methods of degassing and refining the alloys, for example, evacuation and blowing of the alloys with Ar as a result of which the gas porosity is decreased sharply and the water tightness and mechanical properties of the alloys are improved. There are 2 tables.

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FIRSOVA, S.A.

5085:50876  
27 APR 73

17

INDICES OF CHILD POPULATION GROWTH INDICES IN IVANOVSKAYA OBLAST AND EVALUATION THEREOF  
UDC: 614.1:112.1(470.315)

Article by S.A. Firsova, All-Union Scientific Research Institute of Social Hygiene and Public Health Organization (Acad. N.A. Semashko, Moscow: Moscow Sovetskoye Zdravookhraneniye, Moscow, No. 1, 1972, submitted 3 October 1972, pp 10-13)

Ivanovskaya is one of the oblasts where a complex study is in progress of the physical condition of the population which was coordinated with the pursue an in-depth analysis of the dynamics of the principal indices of population growth.

Ivanovskaya Oblast was formed by decree of All-Russian Central Executive Committee dated 14 January 1929, and was comprised of part of Yaroslavlskaya, Vladimirskaya, and Kostromskaya Provinces, as well as Ivanovo-Voznesenskaya Province founded on 18 June 1918. The demographic indices of these provinces differed negligibly from one another. A high birth rate in them was combined with a high overall death rate. At the start of the 20th century, as well as in the first 10 years thereof the death rate in Yaroslavlskaya Province was lower and in Kostromskaya and Vladimirskaya Provinces higher than the corresponding indices for European Russia (Table 1).

Child mortality was also very high in these areas. In 1901-1903, 326 out of every 1,000 births died before the age of 1 year in Yaroslavlskaya Province, 345 in Vladimirskaya, and 352 infants in Kostromskaya. Child mortality in these provinces was considerably higher than the overall figure for the European part of Russia (2639/1000). Of the 50 provinces in European Russia, Kostromskaya Province was in 5th place with regard to child mortality, Vladimirskaya was in 9th, and Yaroslavlskaya in 12th place.

It is known that child mortality is one of the most sensitive indices of social living conditions while its level is closely related to the quality of health care which society is able to provide to its members. The adverse ratio between birth and death rates, and the very high child death rate were tantamount to a poor health condition of the population of the provinces late in the 19th and early in the 20th century.

**Table 1.** Dynamics of indices of population growth in different provinces of European Russia in 1896-1926 (per 1,000 population)

[illegible]

**Legend:**

- 1) birth rate
- 2) death rate
- 3) population growth
- 4) Yaroslavlskaya
- 5) Vladimirovskaya
- 6) Kostromskaya
- 7) Ivanovo-Voznesenskaya
- 8) European Russian

55.A. Kovosel'skiy, "Statistics on High Death Rate in Russia." Vestnik  
Obshchestvennoy Gilyany (Vestnik of Social Hygiene), 1908, pp 19-22.  
46-38

<sup>10</sup> Statisticheskoye Divizheniye NSPSM za 1926 (Population Growth in NSPSM in 1926), Izd. Central Statistical Administration of NSPSM, 1928.

The Great October Socialist Revolution altered radically living conditions for the people. By virtue of new socio-economic conditions and measures adopted by the Soviet government already in 1925, a decline in death rate was noted in all of the provinces mentioned. As compared to 1890-1901, in 1926 the death rate showed a 42.0 percent decline in Vladimirovskaya Province, 51.2 percent decline in Kirovoblagrad, and 35.5 percent decline in Yaroslavlskaya Province. An equally significant decline in death rate was noted against a background of a slight decline in birth rate in Vladimirovskaya and Kirovoblagrad Provinces (with negligible rise of the latter in Yaroslavlskaya). On the whole, for the three provinces, between the start of the 20th century and 1926 the overall death rate dropped by 42 percent and birth rate dropped by only 4 percent, and this led to a more than 100 percent rise in population growth. On the average, for the provinces mentioned to become part of Lysynovskaya region, in 1926 the birth rate constituted 42.13 per 1,000, and the death rate 19.1 per 1,000, which is indicative of a substantial improvement of the physical condition of their population.

In subsequent years there was further decline in birth rate, overall and especially child mortality, and the rate of decline of death was higher than the rate in decline of births (Table 2).

In the previous years the birth rate in Ivanovskaya Oblast constituted 32.6 percent per 1,000, which is 1.4 per 1,000 higher than the same period

USSR

UDC 669.017:620.18

KARSANOV, G. V., KURDYUMOVA, G. G., MIL'MAN, Yu. V., PONOMAREV, Yu. N.,  
SARZHAN, G. P., TREPILOV, V. I., FIRSTOV, S. A., KHAZANOVA, T. P., and YUSHKO,  
V. G., Moscow, Kiev

"Investigation of the Structural Condition and Mechanical Properties of a Two-  
Phase Alloy Containing Chromium and Nickel"

Moscow, Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 71, pp 67-74

Abstract: The structure of a chromium alloy containing 34.4 wt % Ni was  
investigated by methods of electron-microscopy of thin foils and X-ray and  
metallographic analyses, after being subjected to various thermal and thermo-  
mechanical treatments. The investigation data are compared with mechanical  
bending test data and analyzed from the standpoint of dislocation concepts  
and ideas of the character of the electronic structure of transition metals.  
Reference is made to microphotographs of the structure of the hardened alloy  
Cr - 34.4 Ni and its structural changes resulting from annealing at different  
temperatures and to diagrams showing effects of annealing at 900°C on  
mechanical properties, lattice parameter, hardness, and relative quantities of  
 $\alpha$ - and  $\delta$ - phases. The probability is indicated of increasing the strength

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KARSANOV, G. V., et al., Fizika i Khimiya Obrabotki Materialov, No 5, Sep-Oct 71, pp 67-74

characteristics of the investigated alloy at the expense of precipitation strengthening. Five illustr., 12 biblio. refs.

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USSR

UDC:620.179.152

EIRSTOV, V. G., MAYOROV, A. N., SUL'KIN, A. G., CHEREVATENKO, G. A. and YAKSHIN, V. V.

"New Sharp-Focus Iridium-192 Sources for Radiography"

Defektoskopiya, No. 3, 1970, pp. 95-100

Abstract: Some problems involved in the application of sharp-focus iridium-192 sources in the radiography of industrial products are studied. The expediency of using these sources for radioscopy of welded tubes is demonstrated, particularly for testing in difficulty accessible locations at short focal lengths. The results produced are explained using data on quantities comparing the unsharpness of gamma images and spectral distributions from standard and sharp-focus sources. The use of sharp-focus gamma radiation sources of this type allows radiographic testing of industrial products at focal distances 3-times shorter than when standard sources are used, expanding the boundaries of application of gamma defectoscopy of welded joints. The sensitivity of radiography using

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USSR

UDC:620.179.152

FIRSTOV, V. G., MAYOROV, A. N., SUL'KIN, A. G., CHEREVATENKO, G. A.,  
YAKSHIN, V. V., Defektoskopiya, No. 3, 1970, pp. 95-100

sharp-focus sources is improved in comparison with standard sources, both as a result of the decrease in the geometric unsharpness of gamma images and due to improvement of the spectral distribution of the radiation.

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1/5 026 UNCLASSIFIED PROCESSING DATE--16OCT70  
TITLE--ENGINEERING OUTLINE 211, MINIATURE CRYOGENIC REFRIGERATORS -U-  
AUTHOR--FIRTH, I.  
COUNTRY OF INFO--USSR  
SOURCE--ENGINEERING, 23 JANUARY 1970, VOL 209, NR 5412, PP 93-96  
DATE PUBLISHED--23JAN70  
SUBJECT AREAS--MECH., IND., CIVIL AND MARINE ENGR, PHYSICS  
TOPIC TAGS--CRYOGENIC REFRIGERATOR, GAS LIQUEFACTION, LIQUID NITROGEN,  
CRYOGENIC LIQUID COOLING, HYDROGEN, HELIUM, EXPANDING GAS, RELIABILITY  
CONTROL MARKING--NO RESTRICTIONS  
DOCUMENT CLASS--UNCLASSIFIED  
PROXY REEL/FRAME--1995/0832 STEP NO--UK/0000/70/209/000/0093/0096  
CIRC ACCESSION NO--AP0116361  
UNCLASSIFIED

2/5 026

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0116361

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. MICROFICHE OF ABSTRACT CONTAINS GRAPHIC INFORMATION. MINIATURE REFRIGERATORS FOR GENERATING TEMPERATURES BELOW 77DEGREEK (MINUS 196DEGREEK), THE BOILING POINT OF LIQUID NITROGEN, ARE BASED UPON TECHNIQUES WHICH ARE ALSO USED IN LARGER SYSTEMS FOR THE PRODUCTION OF CRYOGENIC LIQUIDS IN BULK. MINIATURIZATION CAN BE CARRIED TO THE LOWEST TEMPERATURES ACHIEVEABLE WITH GASES AND CAN BE PERFECTED TO GIVE RELIABLE OPERATION FOR VERY LONG PERIODS BETWEEN FAULTS. THE REFRIGERATION SYSTEMS WHICH HAVE BEEN MINIATURED ARE BASED ON COOLING BY JOULE THOMSON EXPANSION, OR ON THERMODYNAMIC EXPANSION ENGINE CYCLES, SUCH AS THOSE OF CLAUDE, STIRLING OR GIFFORD MCMAHON. REFRIGERATOR SYSTEMS BASED ON COOLING BY JOULE THOMSON EXPANSION ARE THE SMALLEST AVAILABLE. TO REACH 77DEGREEK WITH NITROGEN, THE LIQUEFIER CAN BE AS SMALL AS 7 MM IN DIAMETER BY 25 MM LONG AND WEIGH ONLY 5.3 G, 3, 4. THE BULK OF THE LIQUEFIER IS FORMED BY A FINNED, HELICALLY WOUND HEAT EXCHANGER IN WHICH COLD, LOW PRESSURE EXHAUST GAS COOLS INCOMING HIGH PRESSURE GAS TO THE EXPANSION VALVE. BECAUSE OF THE LOW MASS OF THE UNIT, LIQUID NITROGEN AT 77DEGREEK CAN BE MADE IN LESS THAN 10 SEC, AND IN UNITS DESIGNED FOR HIGH SPEED IN ABOUT 4 SEC, WITH ONE HALF W USEFUL REFRIGERATION CAPACITY. THE JOULE THOMSON SYSTEM OPERATES ON THE PRINCIPLE THAT A THROTTLING EXPANSION OF ANY GAS BELOW ITS INVERSION TEMPERATURE CAUSES A REDUCTION IN TEMPERATURE. TO PRODUCE A TEMPERATURE OF 77DEGREEK, HIGH PRESSURE NITROGEN GAS, AT ABOUT 280 ATM (4,200 LB-IN PRIME2), IS LEAD THROUGH THE HEAT EXCHANGER TO THE EXPANSION ORIFICE.

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PROCESSING DATE--16OCT70

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ABSTRACT/EXTRACT--THE JOULE THOMSON EXPANSION ORIFICE IS FIXED AND IS VERY SMALL, ABOUT 0.045 MM. AS COOLING IS PROGRESSIVE, LIQUID NITROGEN IS FORMED AT THE ORIFICE SHORTLY AFTER START UP. THE LIQUID MUST BE COLLECTED IN SUCH A MANNER THAT THE EQUIPMENT TO BE COOLED IS BROUGHT INTO DIRECT THERMAL CONTACT WITH THE LIQUID. THE COMPOSITE LOW TEMPERATURE APPARATUS IS THERMALLY ISOLATED BY A VACUUM DEWAR MADE OF SILVERED GLASS, OR STAINLESS STEEL WITH THE ADVANTAGE OF INCREASED ROBUSTNESS. THE TEMPERATURE OF LIQUID HYDROGEN (20DEGREESK) AND HELIUM (4DEGREESK) CAN BE ATTAINED WITH A TWO OR THREE STAGE JOULE THOMSON SYSTEM USING, RESPECTIVELY, THESE GASES AS THE WORKING SUBSTANCES. IN A COMPOSITE SYSTEM, THE NITROGEN LIQUEFIER COOLS HIGH PRESSURE HYDROGEN TO BELOW ITS INVERSION TEMPERATURE BY MEANS OF A HEAT EXCHANGER, WHICH THEN UNDERGOES A JOULE THOMSON EXPANSION TO PRODUCE LIQUID HYDROGEN, 5. A THIRD HELIUM STAGE CAN BE ADDED IN WHICH HELIUM IS LIKewise COOLED BY THE HYDROGEN SECOND STAGE BEFORE IT IS EXPANDED TO PRODUCE LIQUID. TWO STAGE LIQUEFIERS PRODUCING A TEMPERATURE OF 20DEGREESK WEIGH ABOUT 45 G, COOL DOWN IN 1 TO 3 MIN, AND HAVE AN ENDURANCE OF ABOUT 12 MIN ON SINGLE GAS CYLINDER CHARGES. A THREE STAGE GIFFORD MCHAHON SYSTEM CAN REACH 14DEGREESK, 6, 7, AND WITH AN ADDITIONAL JOULE THOMSON EXPANSION OF HELIUM BELOW THE LAST STAGE, LIQUID HELIUM TEMPERATURE, 4DEGREESK, CAN BE PRODUCED.

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UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0116361

ABSTRACT/EXTRACT--IN THIS CYCLE, THE THREE EXPANSION SPACES PRODUCE REFRIGERATION IN CASCADE AT THREE DIFFERENT TEMPERATURES, 80DEGREESK, 35DEGREESK AND 14DEGREESK, 6. THERE ARE ONLY TWO VALVES, BOTH AT ROOM TEMPERATURE, AND THE THREE DISPLACERS MAY BE ACTUATED TOGETHER BY ONE RECIPROCATING ROD. THE ONLY MOVING PARTS AT LOW TEMPERATURE ARE LOOSELY FITTING, DISPLACER CYLINDER SETS WITH VERY LITTLE MECHANICAL STRESS ON THEM. THE SEAL PROBLEM IS NOT DIFFICULT, FOR THE PRESSURE DIFFERENCE ACROSS THE SEAL IS SMALL, BEING THAT REQUIRED TO FORCE THE GAS TO FLOW THROUGH THE REGENERATORS ONLY. THE REGENERATOR IS A UNIT CONTAINING A SPECIALLY DESIGNED WIRE MESH OF SMALL TOTAL VOLUME BUT WHICH CAN TAKE UP, OR RELEASE, 'COLD' EFFICIENTLY. ITS FUNCTION IS TO CONSERVE REFRIGERATION DURING THE CYCLE AND TO PREVENT COLD LOSSES WHEN GAS IS EXHAUSTED TO LOW PRESSURE. THE HEAT ENGINE CYCLE IS THE SAME FOR EACH DISPLACER EXCEPT THAT OPERATION IS BETWEEN TWO DIFFERENT TEMPERATURES IN EACH. THE MOTION OF THE DISPLACERS IS GEARED TO THE OPERATION OF THE VALVES. WITH THE DISPLACERS AT THE BOTTOM OF THEIR STROKE, HIGH PRESSURE HELIUM GAS IS ADMITTED AT ABOUT 15 TO 20 ATM. THE INTAKE STROKE FOLLOWS, WITH THE DISPLACERS MOVING TO THE TOP OF THEIR STROKE, THEREBY DISPLACING THE GAS CONTAINED IN THE TOP OF EACH CYLINDER THROUGH THE REGENERATORS TO THE NEWLY FORMED VOLUME AT THE BASE OF THE CYLINDER. DURING CONTINUOUS OPERATION THE REGENERATOR IS COLD AT THIS POINT IN THE CYCLE AND HENCE THE DISPLACED GAS IS COOLED AS IT FLOWS THROUGH THE UNIT. THE GIFFORD MCMAHON REFRIGERATOR CAN BE MADE INTO A COMPACT UNIT, ABOUT 8 IN IN DIAMETER AND 20 IN LONG.

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PROCESSING DATE--16OCT70

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ABSTRACT/EXTRACT--THE REFRIGERATOR IS HOUSED IN A STAINLESS STEEL DEWAR VESSEL WHICH IS LARGE ENOUGH TO INCORPORATE THE DEVICE TO BE COOLED. THE HELIUM GAS COMPRESSOR FOR THE LIQUEFIER IS NOT LARGE, PRODUCING ONLY REASONABLE PRESSURES, AND CAN BE STATIONED AWAY FROM THE ACTUAL LIQUEFIER. MAINTENANCE OF THE DRIVE DISPLACER ASSEMBLY OR COMPRESSOR CAN BE CARRIED OUT, OR A REPLACEMENT UNIT FITTED, QUICKLY WITHOUT GREAT DISTURBANCE TO THE REFRIGERATOR. FIGURES OF RELIABILITY HAVE BEEN COLLECTED OVER THE LAST FEW YEARS FOR THIS REFRIGERATOR SYSTEM, WHICH SHOW THAT THE AVERAGE TIME BETWEEN FAULTS IS BETWEEN 10,000 AND 15,000 H, AND THAT SOME REFRIGERATOR UNITS HAVE OPERATED CONTINUOUSLY WITHOUT MAINTENANCE FOR 18,000 H.

FACILITY: UNIVERSITY OF ST. ANDREWS.

UNCLASSIFIED



USSR

UDC546.86'22'151,541.67

FIRTSAK, YU. YU., DOVGOSHCHHEY, N. I., GRYADIL', I. A., and CHEPUR, D. V.,  
Uzhgorod State University

"Physical Properties of SbSi Seignette-Electric Films"

Moscow, Izvestiya Akademii Nauk SSSR, Neorganicheskiye Materialy, Vol 10, No 3,  
Mat 74, pp 402-404

Abstract: Experimental results are presented from producing Seignette electric films of SbSi by the method of discrete vaporization and "two temperatures." Films produced under optimum conditions have a resistivity of  $10^8$ - $10^9$  ohm-cm. The ratio of photoflux to obscure flux amounts to  $10^2$  (at a candle power of 40 w). SbSi films possessing excess  $Sb_2S_3$ , i.e., produced when substrate temperatures are above optimum, possess a low resistivity and very little photosensitivity. The activation energy for SbSi films is 0.84 ev as determined from the relationship of photoflux magnitude to temperature. The Seignette-electric phase transition temperature for these films is  $25-27^\circ$  C. Physical properties of SbSi films are given. Three figures, 11 bibliographic references.

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USSR

UDC 621.315,592

DOVGOSHEY, N. I., ~~FIRTSAK, Yu. Yu.~~, TURIANITSA, I. D., ZAYACHKOVSKIY, V. P.,  
and MEL'NICHENKO, T. N.

"Production and Some Physical Properties of SbSI and SbSeI Films"

V sb. Poluprovodn. elektronika (Semiconductor Electronics -- Collection of Works), Uzhgorod, 1971, pp 66-70 (from RZh-Elektronika i yeye primeneniye, No 9, September 1971, Abstract No 9B165)

Translation: The films were produced by the method of discrete explosive vaporization of source material in a unit mounted at the base of the UVR-2 general-purpose vacuum station. Single crystals obtained from the gaseous phase were used as the source material. Vaporization was conducted at a pressure of  $10^{-4}$  mm of mercury on cold and hot mica and glass substrates. X-ray studies showed that specimens deposited on the cold substrates are quasi-morphous, and films obtained on substrates heated to 150-160°C were polycrystalline. Films deposited on substrates heated to 270°C display an excess of SbS<sub>3</sub> and Sb<sub>2</sub>Se<sub>3</sub>, respectively. Measurements of the electrical conductance were made on films obtained on mica substrates heated to 150-160°C. The temperature dependence of the electrical conductivity for a SbSI film is characterized by a low-temperature linear section with an activation energy

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USSR

DOVGOSHEY, N. I., et al., Poluprovodn. elektronika (Semiconductor Electronics -- Collection of Works), Uzhgorod, 1971, pp 66-70 (from RZh-Elektronika i yeye primeneniye, No 9, September 1971, Abstract No 8B165)

of 0.08 ev and two sections of linear dependence in the region of high temperatures (0-100°C) with activation energies of 0.57 and 0.68 ev. For SbSeI the temperature dependence of electrical conductivity has two linear sections with activation energies of 0.96 and 0.98 ev. The width of the forbidden band  $\Delta E = 1.94$  ev is determined by the spectral dependence of the absorption coefficient (K) for SbSI films at room temperature. The absorption edge K is a straight line in the case of the function  $K^{1/2} = f(h\nu)$ . The function  $K^{1/2} = f(h\nu)$  plotted for SbSeI gives a width of the forbidden band equal to  $1.73 \pm 0.05$  ev and indicates the presence of interzonal indirect junctions. 9 ref. I. I.

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